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A COMPILATION OF MOORED CURRENT DATA AND ASSOCIATED OCEANOGRAPHIC OBSERVATIONS

VOLUME XII (1973 MID-OCEAN DYNAMICS EXPERIMENT (MODE))

WOODS HOLE OCEANOGRAPHIC INSTITUTION, MASSACHUSETTS

NOVEMBER 1976

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Summaries are presented of basic current, temperature and pressure measurements which were made from moored instruments as a part of the Mid-Ocean Dynamics Experiment (MODE) which took place March to July 1973.

Current data are presented as Basic Statistics, Spectral Diagrams, Progressive Vector Diagrams, East vs. North Plots, and Variables vs. Time Plots.

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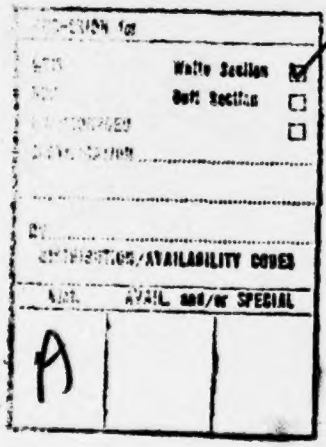

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Approved for Distribution Valentine Worthington

Valentine Worthington, Chairman
Department of Physical Oceanography

ABSTRACT

Summaries are presented of basic current, temperature and pressure measurements which were made from moored instruments as a part of the Mid-Ocean Dynamics Experiment (MODE) which took place March to July 1973.

Current data are presented as Basic Statistics, Spectral Diagrams, Progressive Vector Diagrams, East vs. North Plots, and Variables vs. Time Plots.

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PREFACE

This volume is the twelfth of a series of Data Reports presenting data collected by the W.H.O.I. Buoy Group.

Volume I — W.H.O.I. Ref. 65-44 (unpublished manuscript)
Webster, F., and N. P. Fofonoff, 1965
"A compilation of moored current meter observations, Volume I".

Volume II — W.H.O.I. Ref. 66-60 (unpublished manuscript)
Webster, F., and N. P. Fofonoff, 1966
"A compilation of moored current meter observations, Volume II".

Volume III — W.H.O.I. Ref. 67-66 (unpublished manuscript)
Webster, F., and N. P. Fofonoff
"A compilation of moored current meter observations, Volume III".

Volume IV — W.H.O.I. Ref. 70-40 (unpublished manuscript)
Pollard, R. T., 1970
"A compilation of moored wind and current meter observations, Volume IV".

Volume V — W.H.O.I. Ref. 71-50 (unpublished manuscript)
Tarbell, S., and F. Webster
"A compilation of moored current meter and wind observations, Volume V (1966 measurements)".

Volume VI — W.H.O.I. Ref. 74-7 (unpublished manuscript)
Tarbell, S., 1974
"A compilation of moored wind and current observations taken in 1967, Volume VI".

Volume VII — W.H.O.I. Ref. 74-52 (unpublished manuscript)
Chausse, D., and S. Tarbell, 1974
"A compilation of moored current meter and wind observations, Volume VII (1968 measurements)".

Volume VIII — W.H.O.I. Ref. 75-7 (unpublished manuscript)
Pollard, R. T., and S. Tarbell, 1975
"A compilation of moored current meter and wind observations, Volume VIII (1970 array experiment)".

Volume IX — W.H.O.I. Ref. 75-68 (unpublished manuscript)
Tarbell, S., M. G. Briscoe, and D. Chausse, 1976
"A compilation of moored current data and associated oceanographic observations, Volume IX (1973 Internal Wave Experiment (IWEX))".

Volume X — W.H.O.I. Ref. 76-40 (unpublished manuscript)
Tarbell, S., 1976
"A compilation of moored current data and associated oceanographic observations, Volume X (early 1969 measurements)".

Volume XI — W.H.O.I. Ref. 76-41 (unpublished manuscript)
Tarbell, S., 1976
"A compilation of moored current data and associated oceanographic observations, Volume XI (late 1969 measurements)".

Volume XII presents data from moored instruments collected as a part of the Mid-Ocean Dynamics Experiment (MODE).

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ACKNOWLEDGMENTS

MODE constituted a major effort for all sections of the Buoy Group. Over 50 miles of mooring line with over 700 glass spheres and almost 200 instruments, including releases, radios and lights were set from the Research Vessel Chain in 12 days and recovered in 9 days. This was made possible by much hard work and good humor from everyone involved in the planning and execution of the MODE W.H.O.I. buoy moorings, including the R. V. Chain and her crew who were, as usual, dependable and helpful.

This report was prepared with the help of all members of the Data Processing section of the Buoy Group and in particular by Audrey Williams.

INTRODUCTION

The Mid-Ocean Dynamics Experiment (MODE) was a successful effort to measure large scale, slow moving physical ocean features with a wide variety of instruments. Additional MODE objectives include determining the effects of bottom topography on the mesoscale motions and comparing the interpretation of data gathered from the different types of instruments. MODE was planned as a series of concurrent experiments where each instrument type would comprise an experiment of its own as well as be an addition to the MODE data array.

The W.H.O.I. moorings were only one part of the MODE program. SOFAR floats, airdropsondes, vertical profilers, STDs and tow fish all had experiments of their own. The Institute of Oceanographic Sciences in England and the University of Rhode Island set additional moored current meter stations. The bottom experiment added pressure gauges, electromagnetic transport meters, inverted echo sounders, magnetic field detectors and detectors which measure the vertical component of the electric field to the instrument array.

The active field work involved the crews and scientists aboard six ships and three airplanes which covered the MODE area (Bermuda Triangle) for four months gathering the data from these assorted instruments. An uncounted number of people worked before, during and after MODE towards obtaining high quality data.

For information on other aspects of the MODE project see the following appendixes:

Appendix I List of the participating institutions and principal investigators by project.

Appendix II List of papers about MODE by MODE Contribution Number.

Appendix III List of contributions to the MODE Hot-Line News.

This report presents the data gathered on the W.H.O.I. buoy moorings by current meters and temperature/pressure recorders plus mean CTD temperature and salinity data taken during the mooring recovery phase of the operation.

Hydrography

Ten CTD stations were made on the buoy recovery cruise of the Research Vessel Chain, cruise 112, Leg 6. The CTD was designed by Neil Brown (Brown, 1975; Fofonoff, Hayes and Millard, 1974) and measures conductivity, temperature and pressure. Temperature and salinity profiles, spatially averaged over ten CTD stations, are shown in Fig. 1 (Millard and Bryden, 1973).

Moorings

There were 16 subsurface moorings set and retrieved by the Woods Hole Oceanographic Buoy Group for the MODE array. A seventeenth mooring, the only surface mooring, was set as a reference marker to indicate the center of the MODE area at 28° 00'N, 69° 10'W. This mooring was considered lost after May 23.

The sixteen subsurface moorings had the same basic design with current meters and temperature/pressure recorders shackled into the mooring line at designated depths. Jacketed 3/16" wire was used for the top of the mooring line which was in the fishbite zone. Below the fishbite zone 3/8" dacron was used. The flotation was provided by 16" and 17" glass spheres in hard hat clusters which were attached at intervals along the mooring line. Details on moorings, components and procedures may be found in Heinmiller (1973a), Heinmiller (1973b) and Heinmiller (1975).

Table 1 lists the MODE mooring number, the W.H.O.I. mooring number and the times and location of launch and retrieval.

Figure 2 is a map showing mooring positions and bottom topography.

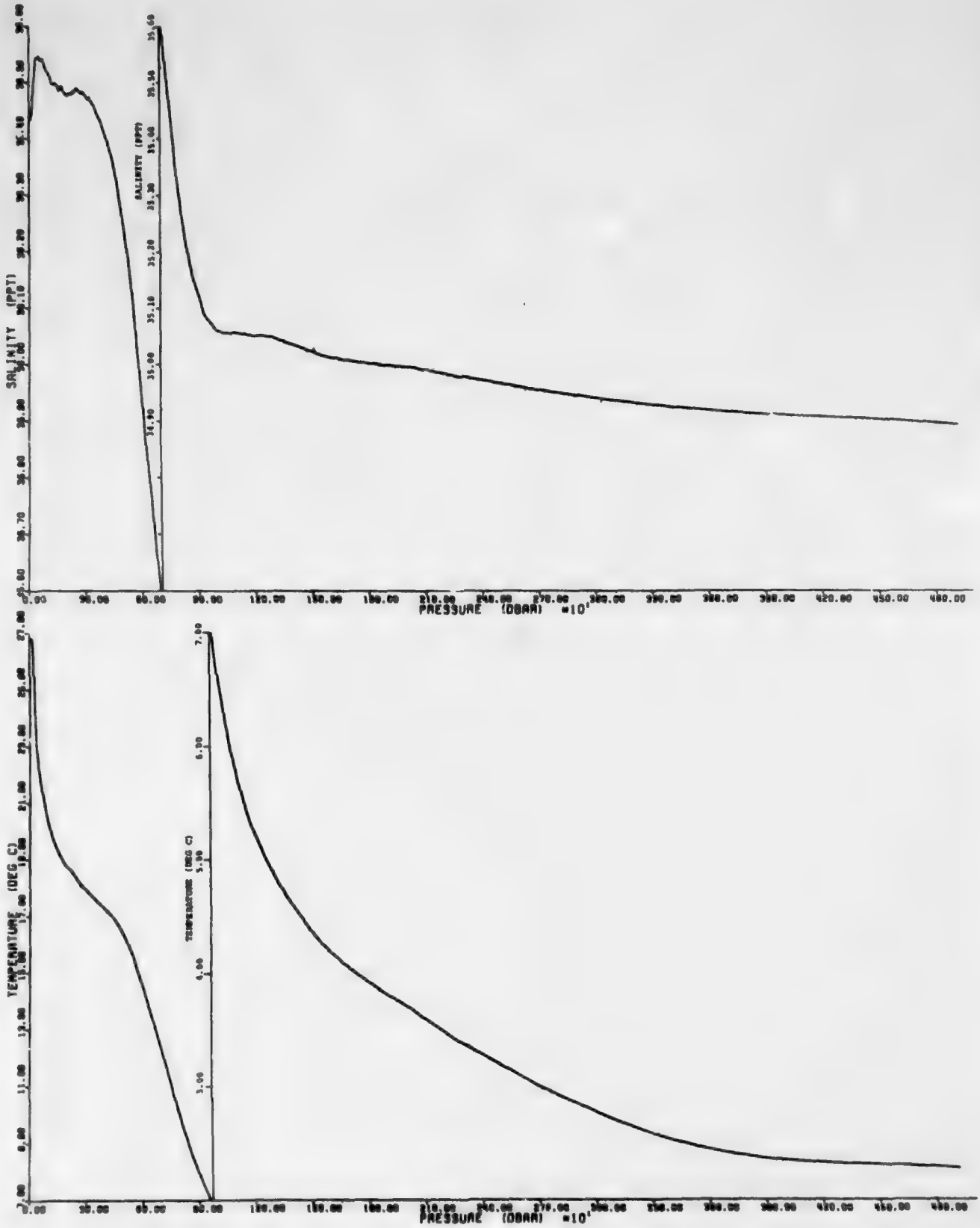

Figure 1. Plots of salinity and temperature from 10 CTD stations

Table 1

MOORING SUMMARY

		LAUNCHED			RECOVERED		
MODE No.	W.H.O.I. No.	Date	Time	Latitude N Longitude W	Date	Time	Latitude N Longitude W
1	WH 481	10 Mar	2358	27°59.8' 69°39.0'	4 Jul	1552	27°58.0' 69°41.6'
2	WH 500	4 Apr	0436	28°17.0' 69°16.3'	27 Jun	0829	28°16.5' 69°16.7'
3	WH 499	3 Apr	1641	28°08.98' 70°08.1'	28 Jun	0305	28°09.0' 70°08.1'
4	WH 498	3 Apr	0623	27°33.1' 69°34.1'	28 Jun	1138	27°33.1' 69°34.1'
5	WH 494	1 Apr	0807	27°49.8' 70°39.8'	29 Jun	2219	27°49.3' 70°39.9'
6	WH 493	31 Mar	1815	28°42.0' 70°15.8'	30 Jun	0514	28°41.8' 70°16.2'
7	WH 501	4 Apr	1200	28°50.1' 69°18.0'	30 Jun	1730	28°50.5' 69°19.0'
8	WH 482	12 Mar	0131	28°09.3' 68°39.3'	26 Jun	0940	28°09.3' 68°38.5'
9	WH 497	2 Apr	1641	27°18.0' 69°01.0'	28 Jun	2336	28°18.4' 69°01.2'
10	WH 495	1 Apr	1645	27°08.8' 70°00.0'	29 Jun	0955	27°08.5' 70°01.0'
11	WH 485	13 Mar	2241	26°23.8' 69°21.0'	2 Jul	2113	26°23.8' 69°20.6'
12	WH 486	14 Mar	1513	26°57.5' 71°02.6'	2 Jul	0523	26°55.5' 71°06.5'
13	WH 488	15 Mar	1516	28°33.1' 71°22.9'	1 Jul	1348	28°29.3' 71°23.9'
14	WH 489	16 Mar	0434	29°35.0' 69°59.1'	30 Jun	2325	29°36.4' 69°59.4'
15	WH 483	12 Mar	1519	29°02.3' 68°13.8'	3 Jul	2322	29°02.6' 68°14.0'
16	WH 484	13 Mar	0834	27°25.1' 67°59.5'	3 Jul	1004	27°22.7' 67°57.9'

All times in GMT

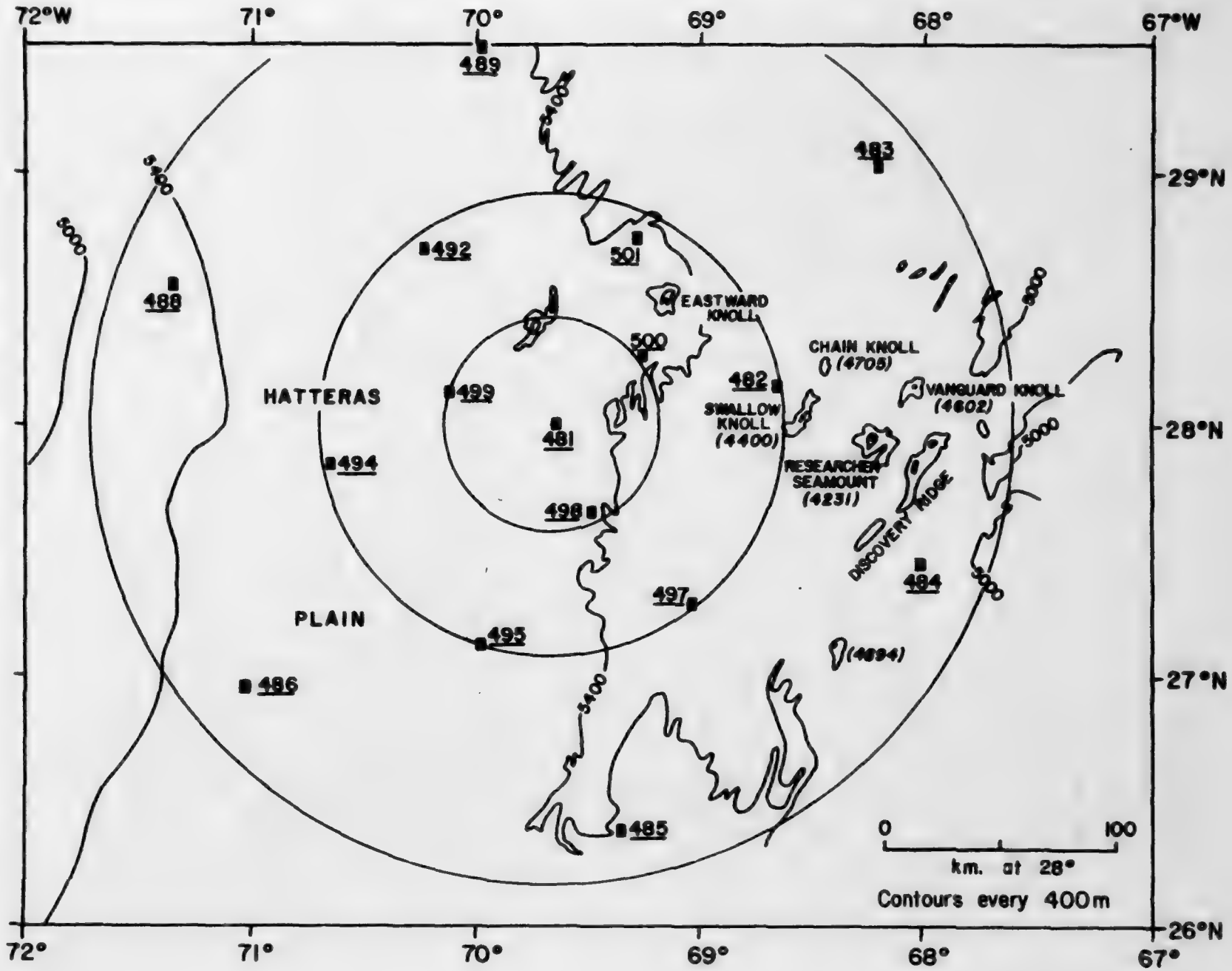

Figure 2. Mooring Location

Temperature/Pressure

An instrument to measure and store pressure, temperature and time data was developed in the Draper Laboratory at M.I.T. for the MODE Data Array. The instrument stores a data sample every 15 seconds and records the sum of 64 successive data samples on a magnetic tape cassette every 16 minutes (64 × 15 = 960 seconds = 16 minutes).

The time base generator, a crystal oscillator, has an accuracy of ±1 second per day.

The thermistor has an accuracy of about .01°C and a resolution of .001°C (Wunsch and Dahlen, 1974).

The pressure sensor is a strain gauge with a manufacturer specified accuracy of .03% of the scale range used (Wunsch and Dahlen, 1974).

Two problems are evident with T/P data. The pressure data from some instruments shows drift due to a change in the bonding material of the strain gauge, for instance pressure data 485,11 on page 235. Another noticeable effect in many pressure records is a decrease in pressure with time caused by stretching of the dacron mooring line. No attempt has been made in this report to correct pressure for either type of drift or to correct temperature for depth excursions.

Depth

There are three depth designations. First is the design depth which is the MODE proposed depth for instruments. Second is the nominal depth which was computed after launch by buoy computer program NOYFB. Third is the depth calculated from the mean pressure values of the M.I.T. temperature/pressure instruments. After the mean pressures were converted to depth in meters then other instrument depths along the mooring line were interpolated from them. Table 2 lists the mean T/P and the recalculated instrument depths.

Plots of pressure which begin on page 240 show some effects of the unpredictable stretch factor of dacron line. A second cause for the difference between nominal and mean depths was that the length of mooring hardware (sling rings, shackles, etc.) was not used by program NOYFB to calculate the length of the moorings.

Table 2

Instrument Depth Derived from Mean Pressure Data

DESIGN DEPTH (m)	W. H. O. I. MOORING NUMBER															
	481	482	483	484	485	486	488	489	493	494	495	497	498	499	500	501
500	391	406	447	441	421	415	419	404	408	391	452	374	413	427	379	421
600	490	507	550	543	520		521	507	512	492	554	478	513	531	485	523
800	697	706	750	744	723	715	719	708	709	691	753	676	713	728	681	723
1000	897	911							908	893		880	914	933	882	
1200	1095				1133							1080				
1500	1392	1411	1450	1443	1426	1420	1429	1414	1410	1395	1452	1381	1414	1428	1382	1425
2000					1926											
2500	2396				2442							2392				
3000	2919	2936	2960	2953	2943	2940	2952	2936	2933	2924	2959	2913	2933	2945	2914	2936
3500	3437											3433				
4000	3963	3957	3968	3973	3981	3948	3972	3959	3957	3954	3962	3940	3948	3956	3936	3951
4400	4382				4387							4346				
B -100	5345	5128	5087		5317	5392	5226	5339	5347	5346	5374	5185				5297

Time

Most data presented from T/Ps, 850s and VACMs used a quartz crystal oscillator with a manufacturer's specified accuracy of ±1 second per day. MODE current meters using crystal clocks had times within 4 minutes of the correct time. More than half of the current meters had a crystal clock error of less than 1 minute over the 130 day operating period. Mechanical clock accuracy was up to two hours off over the same time period.

Clock accuracy is derived by comparing the instrument indicated elapsed time from clock reset to the elapsed time according to radio time stations WWV or CHU.

A second method for determining time accuracy is to place timed real events in the data.

The procedure for putting real time events in current meter data is as follows. The current meters are sent to sea with their rotors and vanes immobilized by taping them to the instrument case. At sea, after the recorder is turned on and has recorded several records, the rotor is untaped and spun during two consecutive record cycles, then taped again. Just before launch both rotor and vane are untaped. The times of the two spins and the final untaping are carefully noted. For retireval the procedure is the reverse. First tape the rotor and vane, then untape and spin, then retape the sensors so that the record ends with an immobilized rotor and vane.

The real time of these events can be compared with the computed time of the events to determine clock accuracy. To determine clock drift the clock is reset to zero before launch at a known time (usually according to radio time signals WWV or CHU). After recovery a time word is read from the instrument and the time the instrument started recording the record is noted. If the instrument time word matches the real elapsed time then the clock drift is the time, usually in seconds, between when the instrument should have started recording and when it actually did start recording. Instruments with good mechanical clocks could also use the real time events to determine clock drift.

In this report time is read as year-month-day hour.minute.second.

Current Meters

Eighty-four current meters were set and retrieved by the W.H.O.I. Buoy Group during MODE. One instrument, the only wind recorder, is presumed stolen as it was on our missing MODE Center surface mooring. Sixty-two of the instruments were Vector Averaging Current Meters (VACMs) built by American Machine and Foundry (AMF). Three instruments were prototype Vector Averaging Current Meters built by Geodyne now a part of Edgerton, Germeshausen and Grier (EG&G). Thirteen Model 850 current meters were also built by Geodyne as were 4 film recording current meters. An additional film recording current meter was loaned by the U. S. Navy. The following institutions contributed current meters: W.H.O.I. (63), I.O.S. (7), U.R.I. (9), Nova University (4) and U. S. Navy (1).

Current Meter Types

The VACM (Vector Averaging Current Meter) gathers compass and vane information and computes E and N components each time a pair of rotor magnets passes the sensing diode and sums these components through the entire recording interval. There are 16 magnets on the rotor so one complete rotor revolution would cause eight compute cycles. The pulses out of the V/F converter, whose output frequency is related to the thermistor resistance at its input, are summed over the recording interval. In the decoding these numbers are converted to mean temperatures. The variables are recorded on a cassette tape at the end of each recording interval.

The Model 850 current meter stores burst sampled data on magnetic tape cartridges. For MODE, each Model 850 that had a crystal clock collected and stored 13 current samples at a 5.27 second sampling rate then turned off for the remainder of the 30 minute cycle. Those Model 850s that were modified to measure temperature store the output count from the temperature circuit for one 5.19 second period at the beginning of each 30 minute interval. Model 850 instruments that used mechanical clocks to measure time collected current information only. Their 13 compass, vane and rotor samples were of 5 second duration each in the 30 minute interval.

Data from the five instruments that recorded on film and also used mechanical clocks are not presented in this report.

Current Meter Problems

The VACMs had two types of instrument failure during MODE. Figure 3 is a current record from MODE with both types of failure. One problem was a chemical deposition in the rotor and vane bearings which hampered the movement of the sensor. The other problem was a diode drifting in and out of its sensing range causing varying and unknown quantities of rotor occurrences to be ignored.

The chemical deposition problem (Dexter, Milliman and Schmitz, 1975) was solved by isolating the bearings so they would no longer be cathodic crevices.

The rotor drop out problem was an electrical one. The semiconductor magneto-diodes sense rotation as magnet pairs attached to the rotor pass by them. The voltage drop across these diodes varies with the magnetic field. As the rotor turns an ac signal is produced. This signal, low in amplitude (about 40 millivolts peak-to-peak), is superimposed on a 6 1/2 volts dc level and balanced by an offset control in the amplifier. This design proved to be unstable; changes in temperature, pressure, and time caused the dc signal to drift. When the signal drifted out of sensing range the turning rotor went undetected. Adding an ac coupled amplifier to the instrument after MODE eliminated the drift sensitivity and the resultant loss of rotor data. It also made the rotor axial adjustment less critical.

The five Model 850 current meter failures were caused by unrelated problems.

All five film instruments had related problems. First the mechanical readout of the film was not very accurate in either the data reading or the time domain. One film was reread at W.H.O.I. by eye. When compared to the mechanical reading it proved that some data records had not been read and that a few sections of data had been moved out of sequence and reinserted later in the record. A second problem was the accuracy of the time base which relates partly to the first problem and partly to the inaccuracies of mechanical clocks.

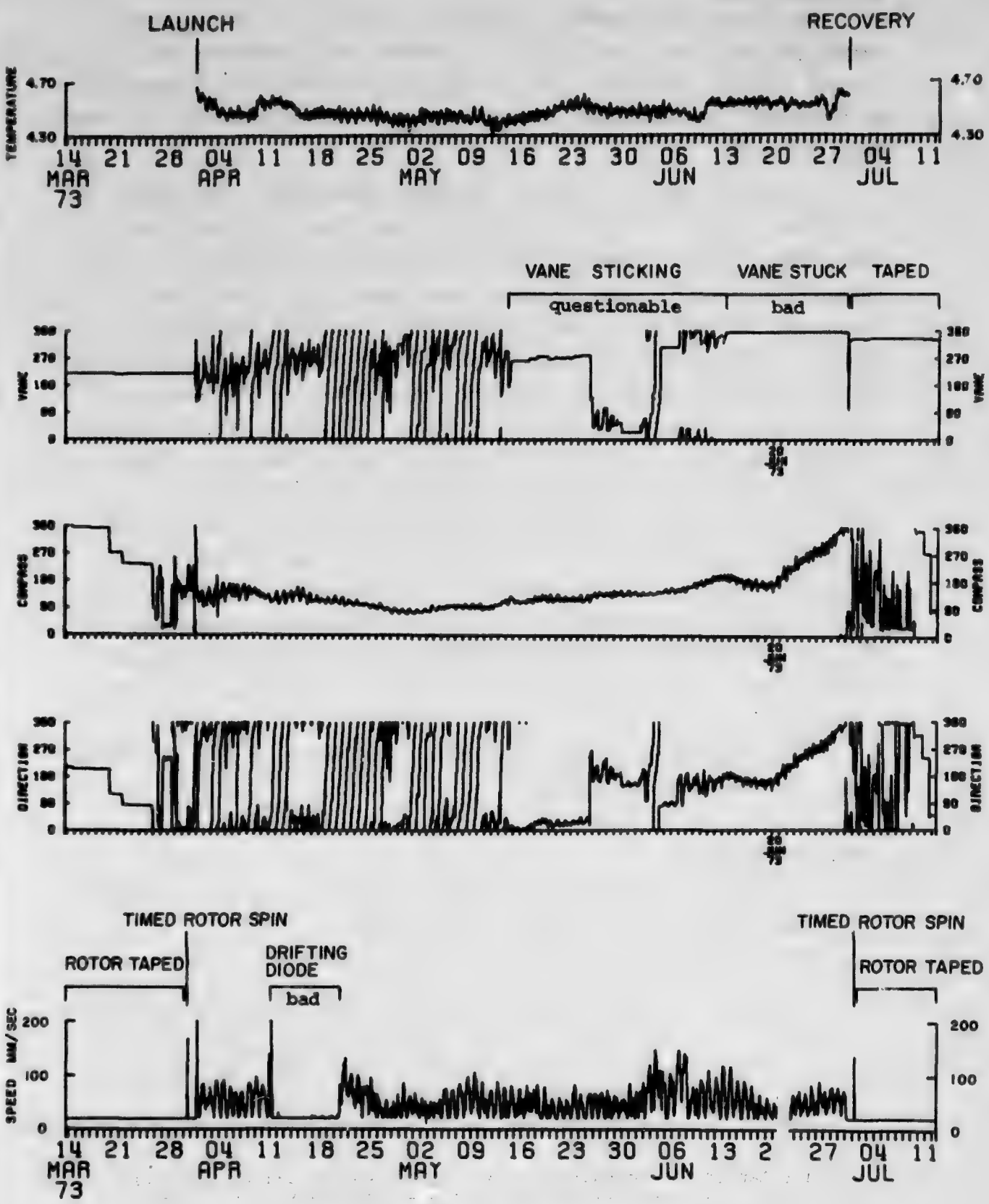

Figure 3. VACM data with instrument problems

Data Processing

Bit strings from magnetic sea tapes for Model 850s (1/4" 2 track cartridges) and VACMs (1/8" 4 track cassettes) were transcribed onto 9 track computer compatible tape at W.H.O.I. The data was then converted to scientific units (decoded) and stored on magnetic tape in Maltais format (Maltais, 1969).

Decisions about current and temperature data quality were made following the decoding. The current data were classified into three categories (good, questionable and bad) for the MODE data users. "Good' is defined to mean that all sensors worked properly. 'Questionable' means that the data had a known problem which might not affect the low frequency data (daily averages). One example is a sticky vane that only registered major changes in direction. 'Bad' means that at least one of the sensors did not work at all. The individual current data presented in this report are 'good' data that are at least 13 days long. Figure 3 is a pre edited data file with good, questionable and bad data.

Editing the data included selecting start and stop times for the data, adjusting the depth of each record to agree with information supplied by the T/Ps, applying corrections to temperature indicated by post cruise thermistor calibrations, computing vector averaged components for each burst for the data from burst sampled Model 850 instruments, and interpolating through gaps in the data caused by the removal of erroneous records.

The result is an evenly spaced time series which is used as a basic input for all further processing.

Data Identifiers

To insure that each data series has a unique identifier the following guide lines are used. For instance, 481,12B900:

481	- The first three digits are the mooring number.
,12	- The 12th instrument down the mooring line. A one digit mooring position is not preceded by a comma (4812D900).
B	- The position of the letter in the alphabet indicates the amount of editing that has been done. The symbol $ means no editing has been done.
900	- Vector averaging interval in seconds. 1H would mean 1 hour averages.
1 d Gau 24	- A 24 hour average over a Gaussian filtered series, Gaussian filter having a half width of 24 hours.

Data Presentation

The data are presented three ways: data from individual current meters are arranged by data number; current meter and temperature/pressure data are displayed as composites by mooring; current vectors are displayed as arrays by depth.

The first section presents current meter data ordered by mooring and instrument position numbers. Each mooring has two pages on which are presented a description and a diagram of the mooring.

The following abbreviations and symbols are used:

*	Current meter data presented
#	T/P data, presented in Data Section 2
+	Temperature only, presented in Data Section 2
850t	Model 850 with temperature modification
FCM	Film recording current meter
Film	Film recording current meter (Navy)
I.O.S.	Institute of Oceanographic Sciences, formerly N.I.O.
U.R.I.	University of Rhode Island
M.I.T.	Massachusetts Institute of Technology
T/P	M.I.T. temperature/pressure recorder
VACM	Vector Averaging Current Meter

Following the mooring information are sets of four pages that display data for each current meter that had 'good' current data (Figure 4). Each set of four pages includes data sampling information, the quality of the various variables, a list of general statistical parameters, and four plots: a scatter plot of U vs. V, a spectral plot, a progressive vector plot and a plot of temperature, U, V, speed and direction vs. time. Temperature is plotted for the time period of good current data.

In Section 2 the current meter and T/P data are presented as a series of composite plots. Both CM and T/P temperature data (Table 3) are subsampled and plotted by mooring number and increasing depth. Pressure data are also subsampled and plotted by mooring number and increasing depth. The temperature and pressure data for each mooring are displayed on facing pages to facilitate comparisons. Stick diagrams of U and V are plotted from 1 day Gaussian filtered data and presented by mooring and increasing depth.

Geographic displays of 4-day averaged current vectors are presented by depth and time.

Table 3

Position Numbers of Presented Pressure Data

Design Depth (m)	W. H. O. I. MOORING NUMBER															
	481	482	483	484	485	486	488	489	493	494	495	497	498	499	500	501
500																
600	4	2	2	2	2	-	2	2	2	2	2	2	2	2	2	2
800	6	-	4	4												
1000	7	4							4	4	-	4	4	4	4	
1200	8				5							5				
1500																
2000	10				7											
2500	11				8							8				
3000	13															
3500	14											10				
4000						6	6	6	7	7	7		7	7		
4400	17				11							12				
B -100	19		8									14				

Position Numbers of Presented Temperature Data

Design Depth (m)																
500	1,2	1	1	1	1			1	1	1	1	1	1	1	1	1
600	3,4	2	2	2	2		2	2	2	2	2	2	2	2	2	2
800	5,6	3	3,4	3,4	3		3	3	3			3	3	3	3	3
1000	7	4			4				4	4		4	4	4	4	
1200	8				5							5				
1500	9	5	5		6	4		4	5	5	5	-	5	5	5	5
2000	10				7											
2500	11				8							8				
3000	12,13	6	6	6		5	5	5	6	6						6
3500	14											10				
4000		7	7	7	10	6	6	6	7	7	7	11	7	7	7	7
4400	17				11							12				
B -100	19		8		12						8	14				

Data name is mooring number plus instrument position number. Therefore the data gathered on mooring 485 by the instrument at 2500 meters is identified by the name 4858.

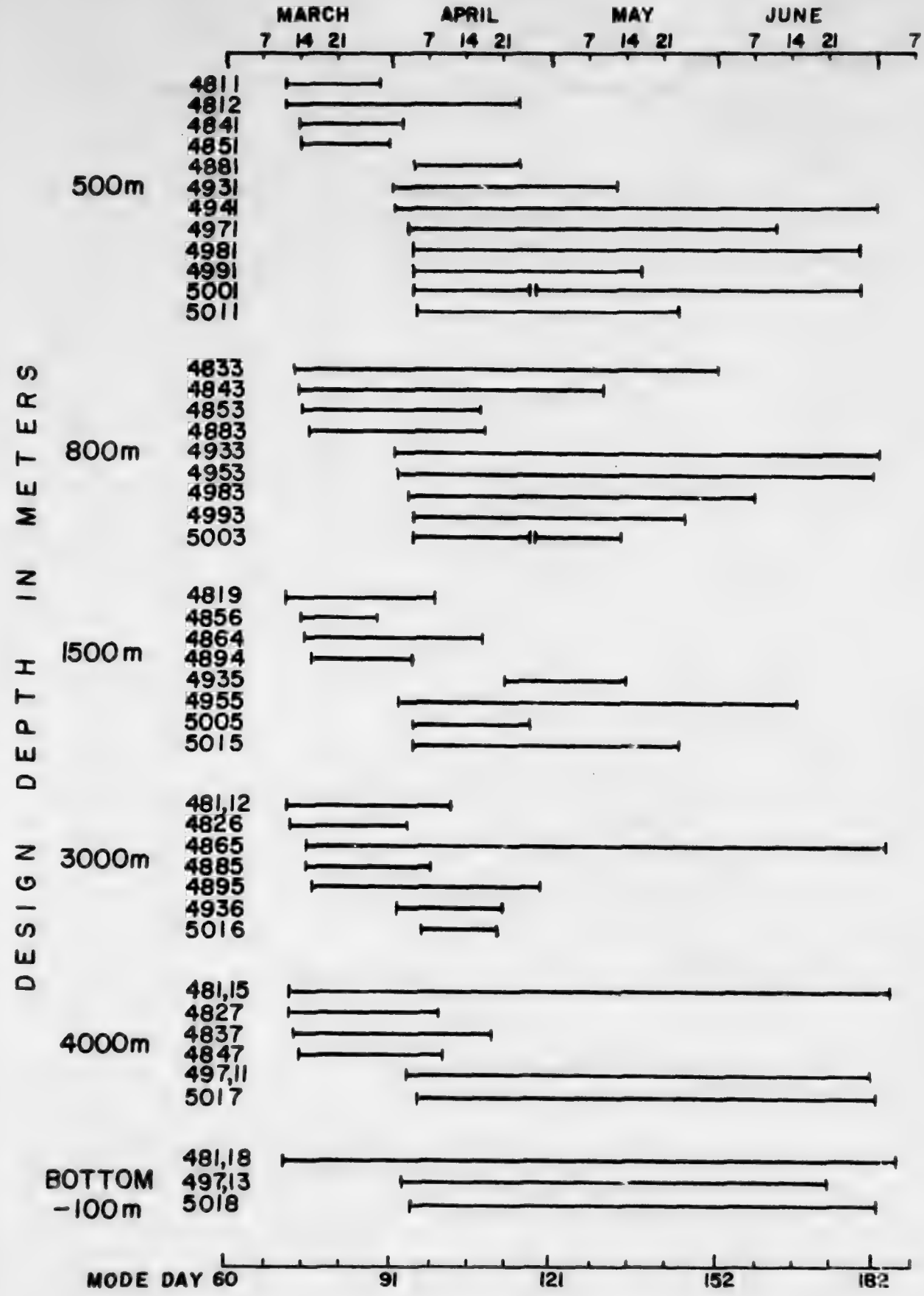

Figure 4. Duration of current data

Computer Programs

The following programs have been used to generate the data displays in this report:

Statistics (STATS)

Standard statistical parameters are calculated for data in the time range given at the bottom of the table. Given n speed and direction or temperature values in a sample, we define $E_i = S_i \sin\theta_i$, $N_i = S_i \cos\theta_i$, then for A = E, N, S, and T,

$$\text{mean, } \bar{A} = \frac{1}{n}\sum_{i=1}^{n} A_i$$

$$\text{variance, } \sigma_A^2 = \frac{1}{n}\sum_{i=1}^{n} A_i^2 - \bar{A}^2$$

$$\text{standard error of the mean} = \frac{\sigma_A}{\sqrt{n}}$$

$$\text{standard deviation} = \sigma_A$$

$$\text{skewness} = \frac{1}{\sigma_A^3}\left[\frac{1}{n}\sum_{i=1}^{n} A_i^3 - \frac{3\bar{A}}{n}\sum_{i=1}^{n} A_i^2 + 2\bar{A}^3\right]$$

$$\text{kurtosis} = \frac{1}{\sigma_A^4}\left[\frac{1}{n}\sum_{i=1}^{n} A_i^4 - \frac{4\bar{A}}{n}\sum_{i=1}^{n} A_i^3 + \frac{6\bar{A}^2}{n}\sum_{i=1}^{n} A_i^2 - 3\bar{A}^4\right]$$

The program also calculates "East and North" statistics,

$$\text{covariance, } M = \frac{1}{n}\sum_{i=1}^{n} E_i N_i - \bar{E}\,\bar{N}$$

$$\text{standard deviation of covariance, } \sigma_m = \frac{1}{n}\sum_{i=1}^{n} (E_i N_i)^2 - \overline{E_i N_i}^2$$

$$\text{standard error of covariance} = \frac{\sigma_m}{\sqrt{n}}$$

correlation coefficient, $M' = \frac{M}{\sigma_E \sigma_N}$.

The program also calculates parameters related to vector quantities: the scalar amplitude of the vector mean, $V_m = \overline{E}^2 + \overline{N}^2$; vector variance, $V_v^2 = \frac{1}{2}(\sigma_E^2 + \sigma_N^2)$; standard deviation = V_v.

Scatterplot

The vector components are plotted against each other to give a pictorial indication of the DIRECTION and SPEED of the velocity vectors. This type plot can be helpful in finding instrument malfunctions and characteristics not easily noticed elsewhere.

Progressive Vector Diagram (PROVEC)

The vector progressive displacements are plotted. The plot begins with an asterisk (*) on a day boundary. All following day boundaries are indicated with a (+). This type of plot accentuates very low frequency events at the expense of higher frequency oscillations which may be hidden by a large amplitude low-frequency current.

Variable vs. Time Plot

This is a diagram of any variable plotted as a function of TIME. The plot is generated from the 1 hour averaged series. This type of plot is complementary to the PROGRESSIVE VECTOR diagram since it accentuates higher frequency events such as inertial and tidal oscillations.

Spectra

The program TIMSAN (TIme Series ANalysis) uses the Fast Fourier Transform algorithm of Singleton (1969) and is restricted to data segments of length N points, where N must be an even number which has no prime factor larger than 5, and must be less than 8000 points; data series longer than this must be broken into two or more pieces.

The number of degrees of freedom for the first 40 plotted points is given by $\nu = a\ m\ s$ where m is the number of adjacent frequency bands being averaged as stated in the label, s is the number of independent data pieces being averaged, again as stated in the label, and a should be two for temperature spectra and for Horizontal Kinetic Energy [HKE] spectra for which the EAST and NORTH components seem statistically

independent. In the absence of information regarding NORTH-EAST correlation, one should use $a = 2$ to be safe.

The log-log plot is further averaged during plotting so that more and more points are averaged together as frequency increases. This eliminates the bunching together of points at high frequencies, increases the degrees of freedom of the high frequency estimates, and still permits low-frequency resolution. The averaging algorithm is as follows: counting from the left of the plot, the first 40 plotted points represent data that has been averaged as stated in the label; the data for the next 15 plotted points has been averaged over twice as many frequency bands; the next 6 over five times as many, the next 40 over ten times as many, the next 15 over twenty times as many, the next 6 over fifty times as many, the next 40 over 100 times as many and so on. In this way, for example, 7900 data points with no averaging indicated in the label would be plotted as only 176 points, and the last 14 estimates would be averaged over 200 basic frequency bands. The m in the formula $\nu = a\ m\ s$ for degrees of freedom is, in this example, 200 times larger at the highest frequencies than at the lowest frequencies.

For $\nu > 30$, the confidence limits for the spectral estimates are given approximately by $(1 - 2/9\nu \pm Z\sqrt{2/9\nu})^{1/3}$ where $Z = 1.28375$ for 80% confidence limits, $Z = 1.645$ for 90%, $Z = 1.96$ for 97% and $Z = 2.5757$ for 99%. In the example above, if the HKE spectral plot label had indicated 2 pieces and averaging over 8 adjacent frequency bands then $\nu = 2 \times 2 \times 8 = 32$ for the lowest frequencies (assuming NORTH and EAST components are highly correlated) and $200 \times 32 = 6400$ for the highest frequencies. The 95% confidence intervals (i.e., 95% of the time one would expect the spectral estimates to vary no more than this much) would be (0.57, 1.55) at low frequencies, and (0.97, 1.03) at high frequencies.

For $\nu \leq 30$, one must obtain confidence intervals from Chi-Squared distribution tables in standard statistical references.

Temperature spectra from 850 current meters show aliasing at high frequencies because of the sampling scheme. Speed and direction are burst sampled 14 times per recording interval. These 14 samples are vector averaged to attenuate high frequency aliasing in the current measurement. There is only one 5.19 second temperature sample per recording interval, however. The temperature spectrum for data series 497,11 shows clearly the resulting high frequency aliasing. In contrast, the VACM averages all variables over the full recording interval, virtually eliminating the problem.

Stick Plot

The basic U and V time series is filtered using a symmetrical running Gaussian filter with a half-width of 24 hours followed by a simple running hat filter. The filtering is sequential and the resultant time series is 48 hours shorter than the input time series (The first and last 24 hours are lost.). Each consecutive plotted vector is the result of a 24 hour average running from midnight to midnight. Vector direction follows normal direction conventions, i.e., north is up.

References

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Dexter, S. C., J. D. Milliman and W. J. Schmitz, Jr., 1975, Mineral deposition in current meter bearings. Deep-Sea Res., 22, 703-706.

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Heinmiller, R. H., 1973a, Cruise Report CHAIN 112, Legs I and II, W.H.O.I. Ref. 73-51 (unpublished manuscript).

Heinmiller, R. H., 1973b, Cruise Report CHAIN 112, Leg VI, W.H.O.I. Ref. 73-50 (unpublished manuscript).

Heinmiller, R. H., 1975, Mooring Operations of the Woods Hole Buoy Group for the Mid-Ocean Dynamics Experiment, W.H.O.I. Ref. 75-42 (unpublished manuscript).

Maltais, J. A., 1969, A nine channel digital magnetic tape format for storing oceanographic data. W.H.O.I. Ref. 69-55 (unpublished manuscript).

Millard, R. C., Jr., and H. Bryden, 1973, Spatially-averaged MODE-I CTD stations. MODE Hot-Line News no. 43 (unpublished manuscript).

Singleton, R. C., 1969, An algorithm for computing the mixed radix Fast Fourier Transform. I.E.E.E. Trans. on Audio and Electroacoustics, AU-17 (2) 93-103.

Wunsch, C., and J. Dahlen, 1974, A moored temperature and pressure recorder. Deep-Sea Res., 21, 145-154.

STATION 480

Surface mooring 480 was set as a reference marker in the center of the MODE area at 28° 00'N, 69° 10'W. Its instruments included four radios, a strobe light, a tension cell and a wind recorder. Early in the morning on May 23rd the bridge personnel of the Research Vessel Chain noticed a ship hove to at the mooring position with deck lights on. As the Cahin got closer the unknown ship turned on her running lights and departed without responding to radio calls. The missing buoy is assumed to have been stolen by that ship as it was never seen again.

MODE CENTRAL SURFACE MOORING (LOST)

Mooring No. 481

Set 1973 Mar 10 — 27° 54.8'N — 69° 39.0'W
Year Month Day — Latitude — Longitude

Set by J. Gifford - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 1

Retrieved 1973 July 04
Year Month Day

Retrieved by G. Tupper - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 6

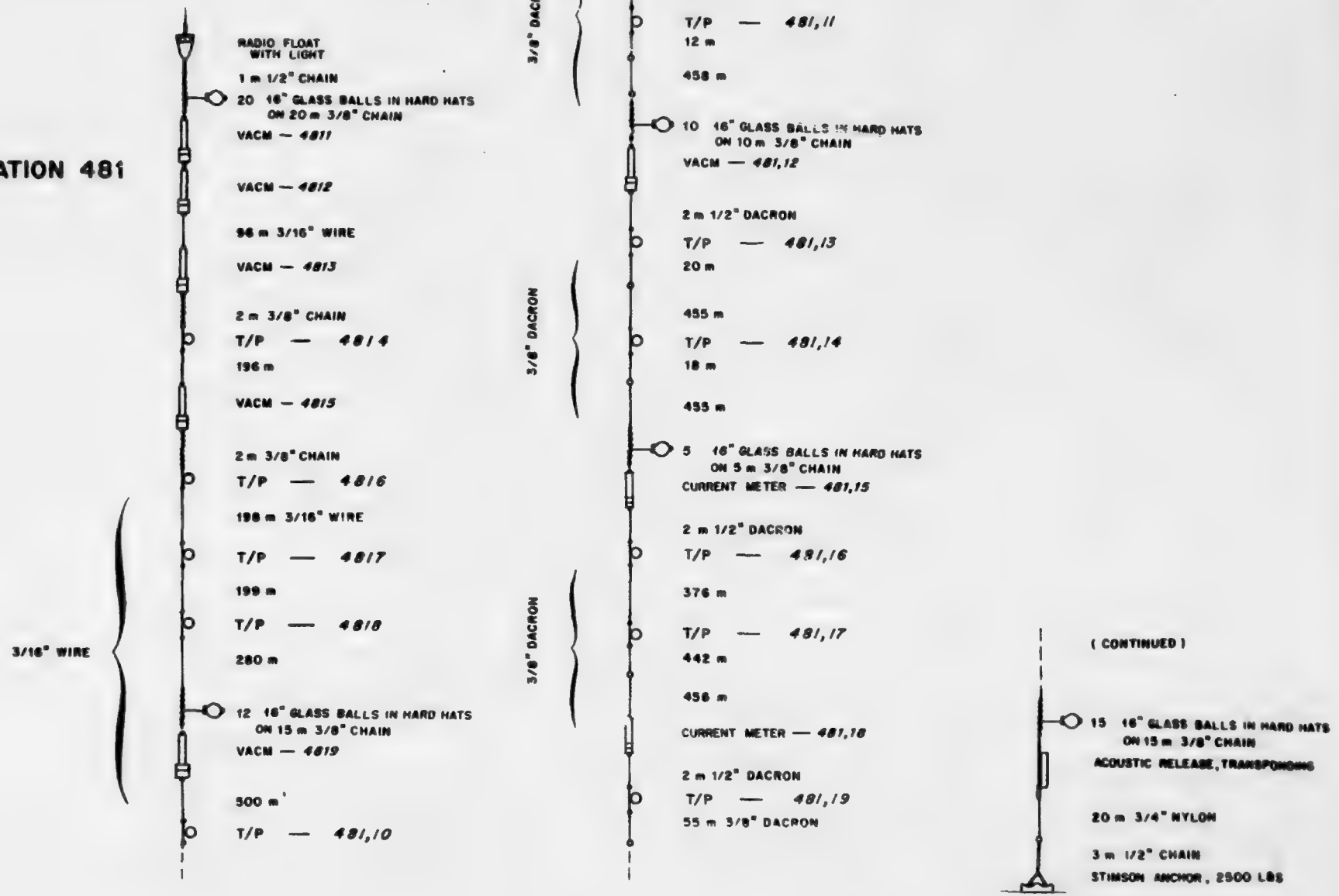
Purpose of Mooring: Mooring #1 of MODE 1 array

Mooring Type: Subsurface mooring

Key	Data Number	Instrument Number	Type	Depth Meters	Comments
*	4811	V-0180	VACM	389	
*	4812	V-0112	VACM	391	
+	4813	V-0110	VACM	489	
#	4814	#07	T/P	490	M.I.T.
+	4815	V-0115	VACM	691	
#	4816	#05	T/P	697	M.I.T.
#	4817	#46	T/P	897	M.I.T.
#	4818	#58	T/P	1095	M.I.T.
*	4819	V-0182	VACM	1392	
#	481,10	#01	T/P	1892	M.I.T.
#	481,11	#17	T/P	2396	M.I.T.
*	481,12	V-0119	VACM	2916	
#	481,13	#16	T/P	2919	M.I.T.
#	481,14	#03	T/P	3437	M.I.T.
*	481,15	M-218	850	3963	U.R.I.
	481,16	#02	T/P	3967	M.I.T.
#	481,17	#12	T/P	4382	M.I.T.
*	481,18	M-221	850	5343	U.R.I.
#	481,19	#04	T/P	5345	M.I.T.
	Water Depth			5462	

COMMENTS ON MOORING:

STATION 481


RADIO FLOAT WITH LIGHT
1 m 1/2" CHAIN
20 16" GLASS BALLS IN HARD HATS ON 20 m 3/8" CHAIN
VACM — 4811
VACM — 4812
96 m 3/16" WIRE
VACM — 4813
2 m 3/8" CHAIN
T/P — 4814
196 m
VACM — 4815
2 m 3/8" CHAIN
T/P — 4816
198 m 3/16" WIRE
T/P — 4817
199 m
T/P — 4818
280 m
12 16" GLASS BALLS IN HARD HATS ON 15 m 3/8" CHAIN
VACM — 4819
500 m
T/P — 481,10
3/16" WIRE
3/8" DACRON
3/8" DACRON
3/8" DACRON
(CONTINUED)
6 m
470 m
T/P — 481,11
12 m
458 m
10 16" GLASS BALLS IN HARD HATS ON 10 m 3/8" CHAIN
VACM — 481,12
2 m 1/2" DACRON
T/P — 481,13
20 m
455 m
T/P — 481,14
18 m
455 m
5 16" GLASS BALLS IN HARD HATS ON 5 m 3/8" CHAIN
CURRENT METER — 481,15
2 m 1/2" DACRON
T/P — 481,16
376 m
T/P — 481,17
442 m
456 m
CURRENT METER — 481,18
2 m 1/2" DACRON
T/P — 481,19
55 m 3/8" DACRON
(CONTINUED)
15 16" GLASS BALLS IN HARD HATS ON 15 m 3/8" CHAIN
ACOUSTIC RELEASE, TRANSPONDING
20 m 3/4" NYLON
3 m 1/2" CHAIN
STIMSON ANCHOR, 2500 LBS

DATA NUMBER 4811

Instrument No.: V-0180 Type: Vector Averaging Current Meter

Depth: 389 m Water Depth: 5462 m

Start time: 73-March 11 06.07.30.

Stop time: 73-March 29 00.37.36.

Duration: 17d 18h 30m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

Compass - good

Vane - sticky June 6 to recovery

Rotor - stuck March 29 to recovery

Temperature - good

STATS DATA/ 4811080DA

	EAST	NORTH	SPEED	*****	EAST & NORTH	*****
MEAN	-80.31	75.77	105.82	COVARIANCE		-127.25
STD. ERR.	.88	1.10	.97	STD. ERR. OF COVARIANCE		101.80
VARIANCE	1361.88	2059.70	1585.87	STD. DEV. OF COVARIANCE		4187.55
STD. DEV.	36.90	45.32	39.85	CORRELATION COEFFICIENT		-.076
KURTOSIS	2.81	2.87	2.80	VECTOR MEAN		88.84
SKEWNESS	-.35	-.43	-.12	VECTOR VARIANCE		1707.78
				STD. DEV.		41.33

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 1707 POINTS

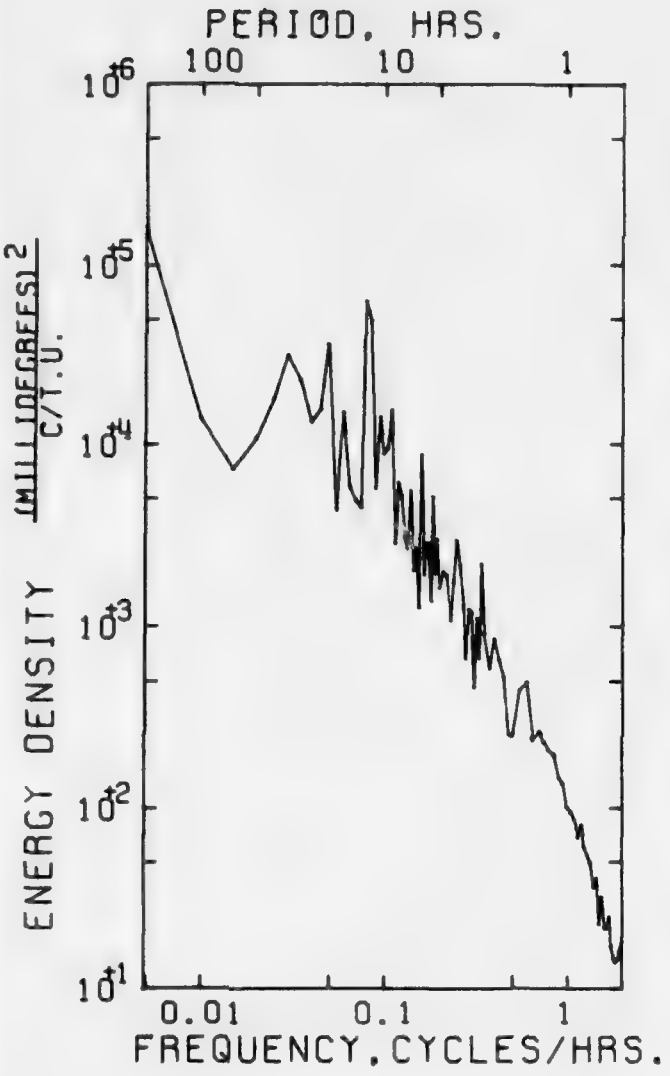
SPANNING RANGE
FROM 73- III-11 06.07.30
TO 73- III-28 00.37.30

DURATION 17 DAYS 18 H 30 M

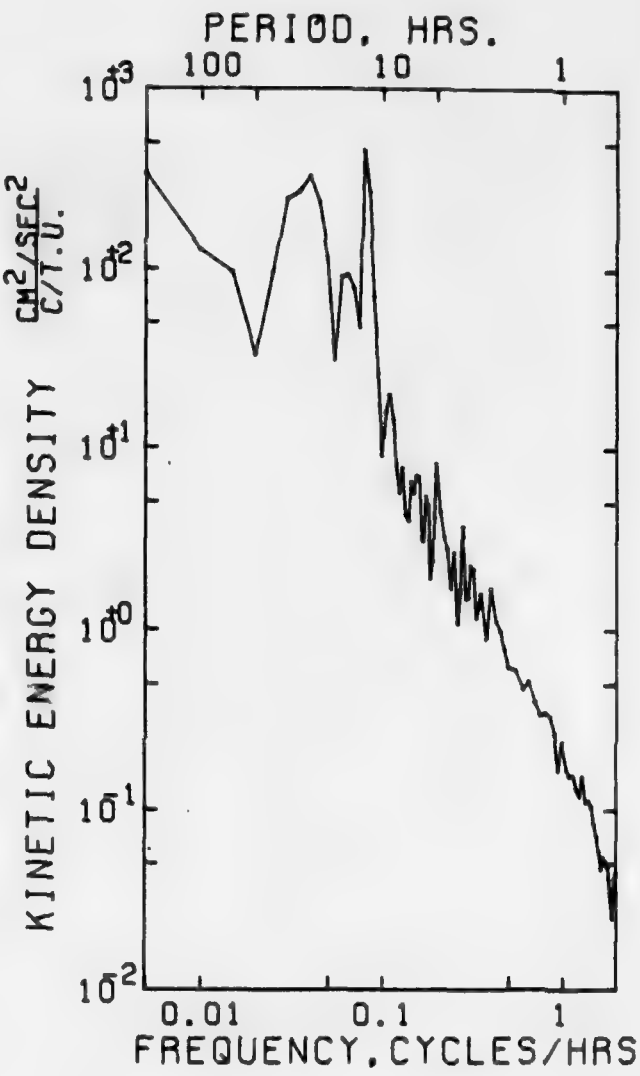
*** TEMPERATURE ***
*** DEGREES C. ***

MEAN	17.360	STD ERR	.002
VARIANCE	.004		
STD. DEV.	.065		
KURTOSIS	3.324		
SKEWNESS	.38[illegible]		

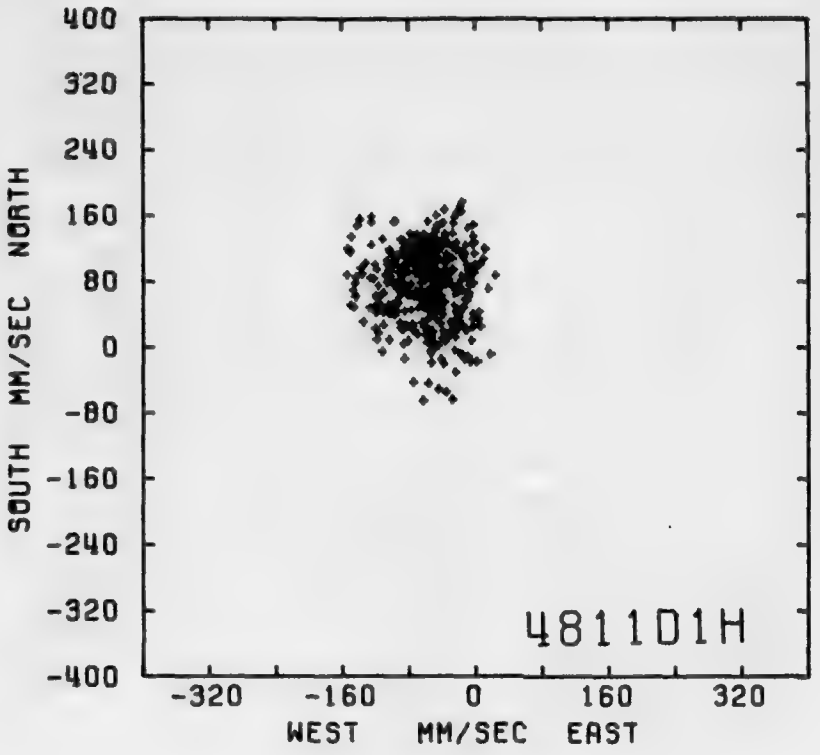
SAMPLE SIZE = 1707 POINTS



AUTO SPECTRUM
48110900 TEMPERATURE
389 METERS
73-III-11 TO 73-III-28
1 PIECES WITH 810 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
48110900 EAST
48110900 NORTH
389 METERS
73-III-11 TO 73-III-28
1 PIECES WITH 810 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS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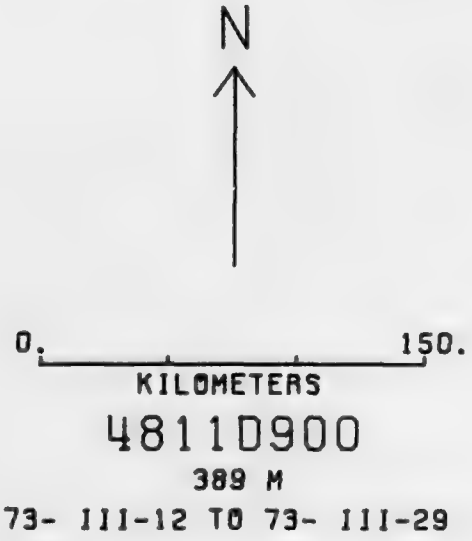
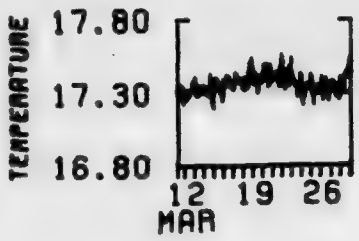
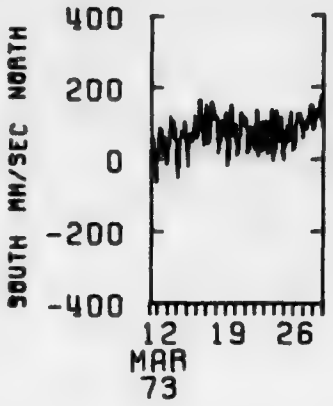
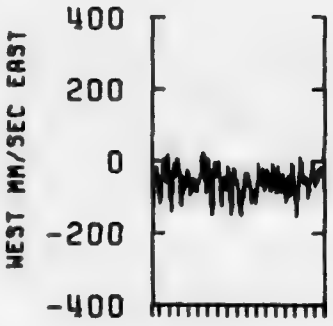
320
240
160
80
0
-80
-160
-240
-320
-400
SOUTH MM/SEC NORTH
-320
-160
0
160
320
WEST MM/SEC EAST
481101H


N
0.
150.
KILOMETERS
481101900
389 M
73- III-12 TO 73- III-29

20
73-III-12

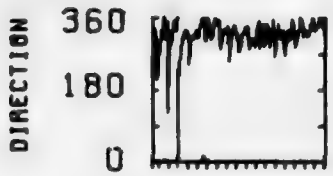


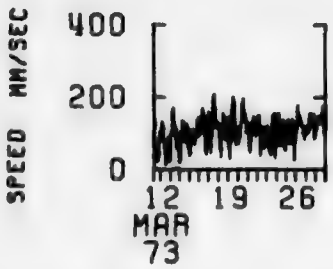




4811D1H

389 M





DATA NUMBER 4812

Instrument No.: V-0112 Type: Vector Averaging Current Meter

Depth: 391 m Water Depth: 5462 m

Start time: 73-March-11 07.11.15.

Stop time: 73-April-23 20.56.15.

Duration: 43d 13h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:
Compass - good

Vane stuck May 20 to end

Rotor below threshold April 23 & 24 and May 8 to June 16

Temperature good

Clock had problem in counting so was not used in decoding. Last events show that the decoded data is within 7 1/2 minutes of the correct time. Because of the recording characteristics of the VACM we can not position events within the 15 minute interval to determine the exact start time of the record. The clock check indicates that the clock drifted 1 minute 13 seconds from February 20 to July 17, 1973.

STATS DATA/ 48120900A

	EAST	NORTH	SPEED	*****	EAST & NORTH	*****
MEAN	-42.12	67.18	86.87	COVARIANCE		-64.21
STD. ERR.	.78	.78	.70	STD. ERR. OF COVARIANCE		70.20
VARIANCE	2548.80	2634.61	2067.40	STD. DEV. OF COVARIANCE		4540.60
STD. DEV.	50.48	51.33	45.47	CORRELATION COEFFICIENT		-.025
KURTOSIS	3.17	3.72	3.01	VECTOR MEAN		79.28
SKEWNESS	.12	.29	.46	VECTOR VARIANCE		2591.76
				STD. DEV.		50.81

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 4184 POINTS

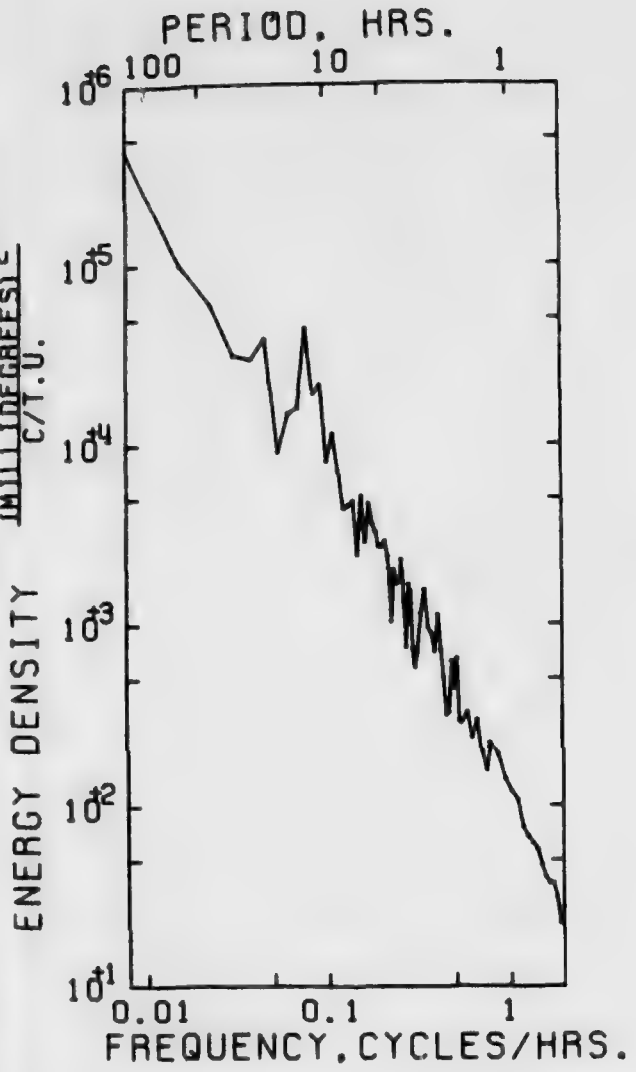
SPANNING RANGE
FROM 73- III-11 07.11.15
TO 73- IV -23 20.56.15

DURATION 43 DAYS 13 H 45 M

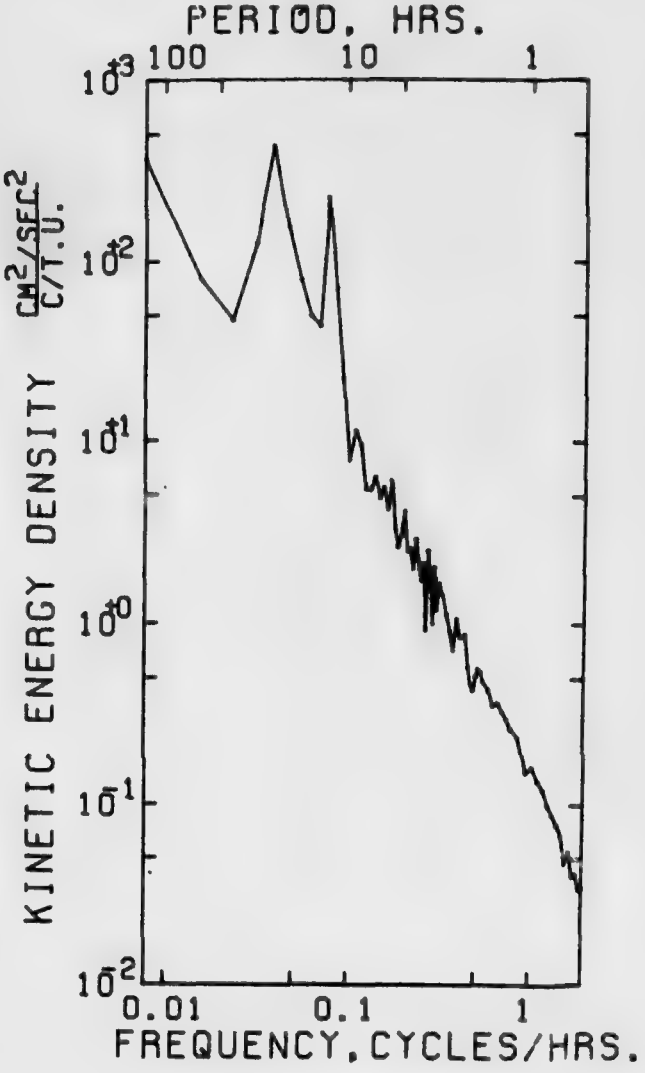
*** TEMPERATURE ***
*** DEGREES C. ***

MEAN	=	17.566	STD ERR = .003
VARIANCE	=	.047	
STD. DEV.	=	.216	
KURTOSIS	=	1.493	
SKEWNESS	=	-.093	

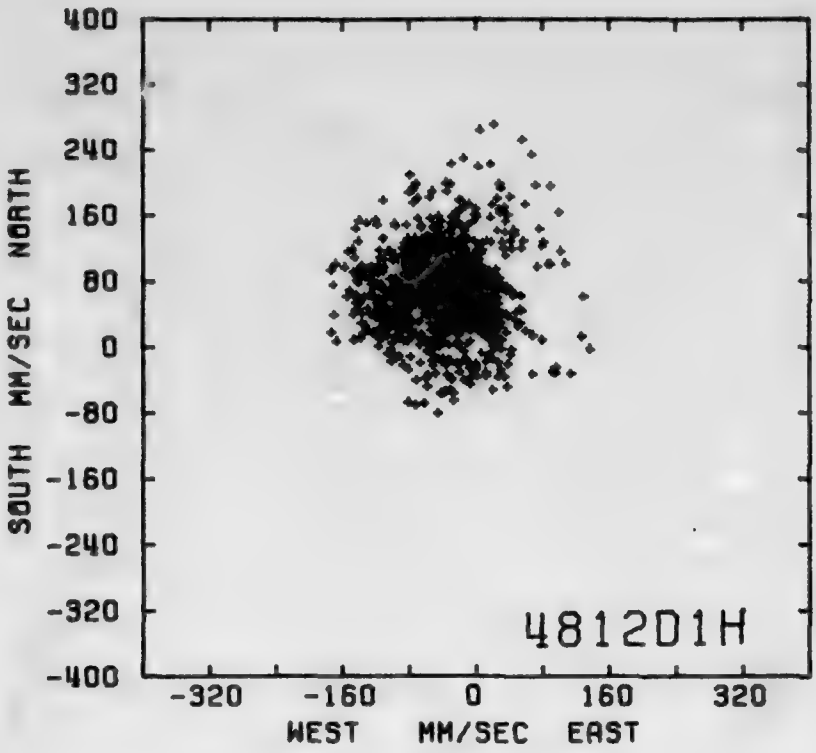
SAMPLE SIZE = 4184 POINTS



AUTO SPECTRUM
48120900 TEMPERATURE
391 METERS
73-III-12 TO 73-IV-23
1 PIECES WITH 2048 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
48120900 EAST
48120900 NORTH
391 METERS
73-III-11 TO 73-IV-22
1 PIECES WITH 2048 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS


400
320
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160
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0
-80
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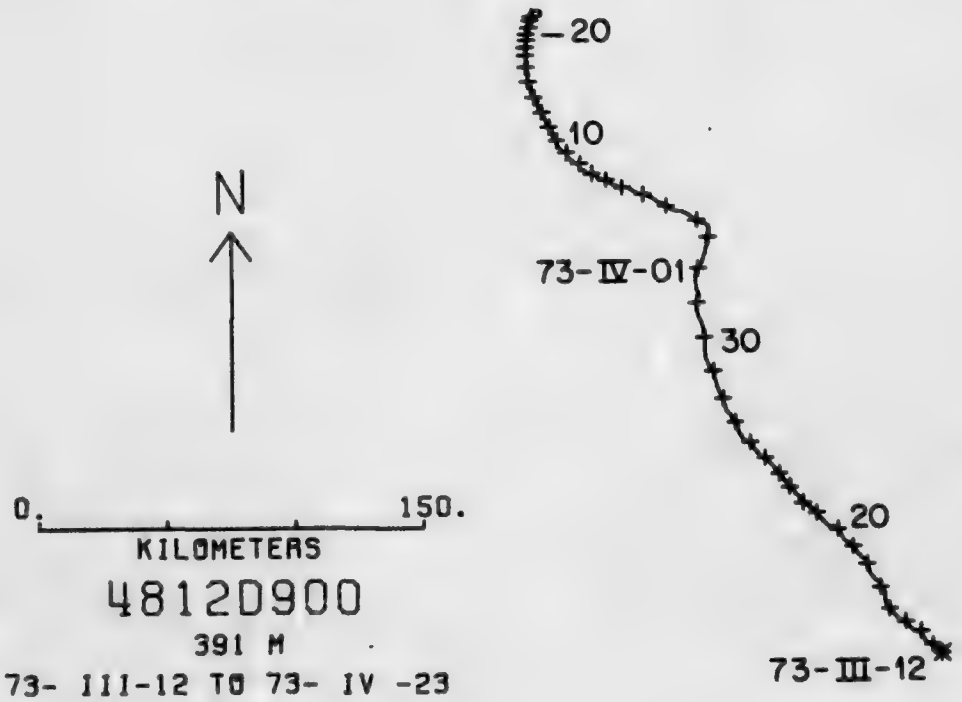
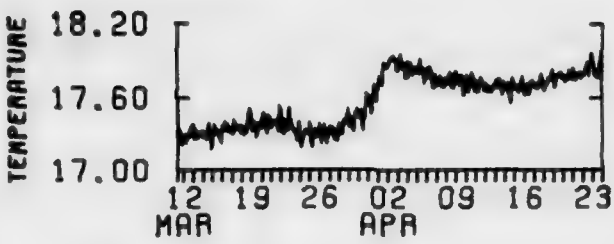
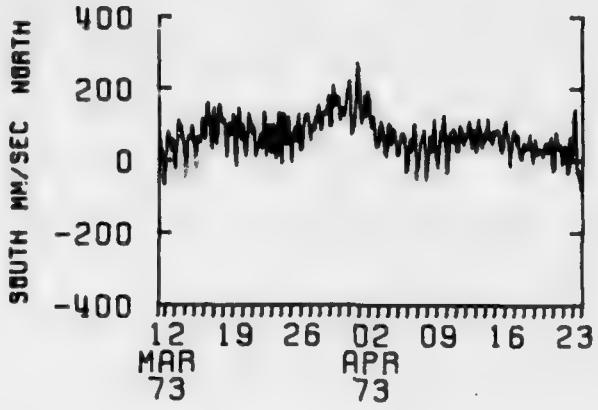
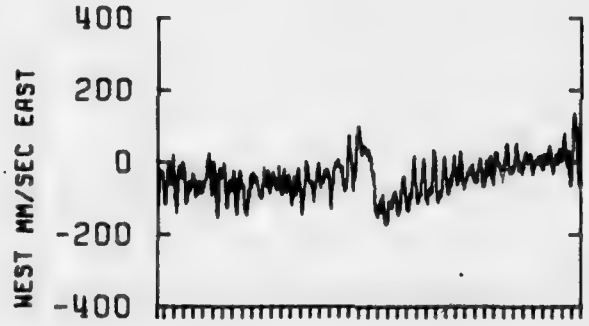
-400
SOUTH MM/SEC NORTH
-320
-160
0
160
320
WEST MM/SEC EAST
481201H


20
10
73-IV-01
30
20
73-III-12
N
0.
150.
KILOMETERS
48120900
391 M
73- III-12 TO 73- IV -23

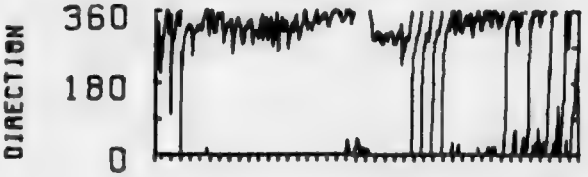


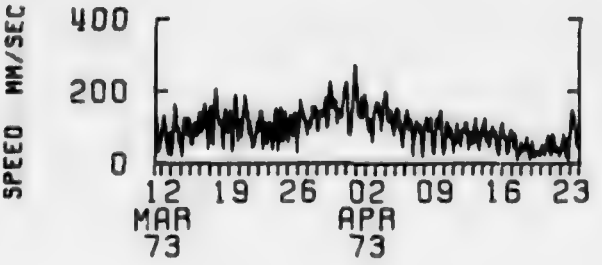




481201H

391 M





DATA NUMBER 4819

Instrument No.: V-0182 Type: Vector Averaging Current Meter

Depth: 1392 m Water Depth: 5462 m

Start time: 73-March-11 14.07.30.

Stop time: 73-April-07 22.52.30.

Duration: 27d 8h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:
Compass - good

Vane - sticky from May 3 to recovery

Rotor - below threshold or highly suspect April 8 to May 4

Temperature - good

STATS DATA/ 4819800A

	EAST	NORTH	SPEED	*****	EAST & NORTH	*****
MEAN =	-27.68	29.39	58.11	* COVARIANCE	=	-91.88
STD. ERR. =	.61	.73	.48	* STD. ERR. OF COVARIANCE	=	35.15
VARIANCE =	984.12	1388.58	588.10	* STD. DEV. OF COVARIANCE	=	1800.66
STD. DEV. =	31.05	37.24	24.46	* CORRELATION COEFFICIENT	=	-.080
KURTOSIS =	2.88	2.47	3.50	* VECTOR MEAN	=	40.31
SKEWNESS =	-.04	-.28	.85	* VECTOR VARIANCE	=	1175.35
				* STD. DEV.	=	34.28

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 2628 POINTS

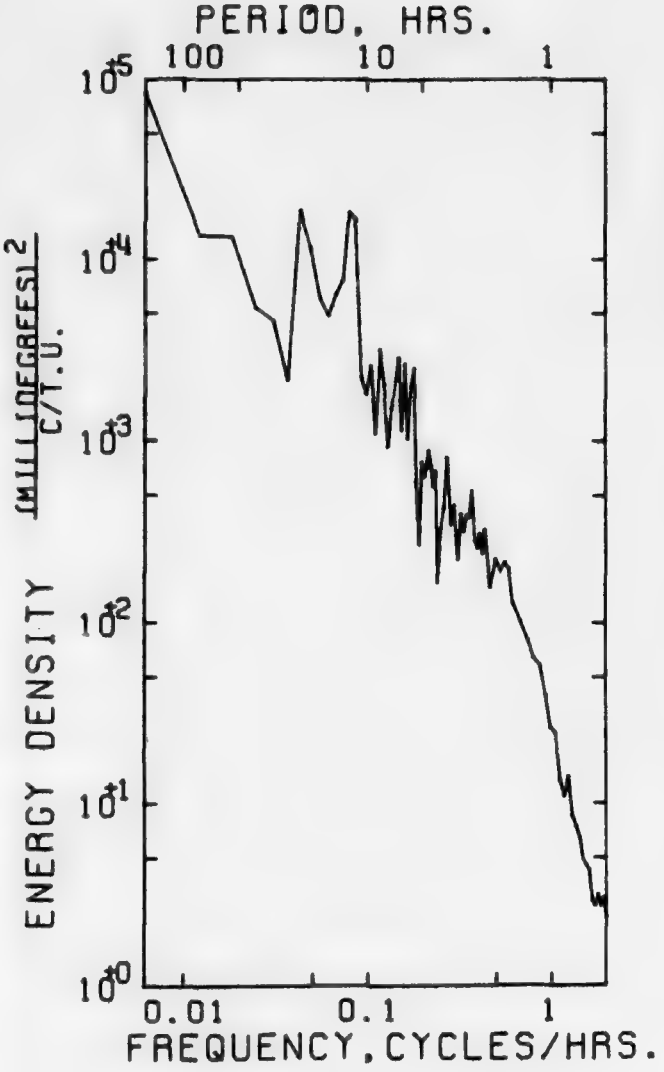
SPANNING RANGE
FROM 73- III-11 14.07.30
TO 73- IV -07 22.52.30

DURATION 27 DAYS 8 H 45 M

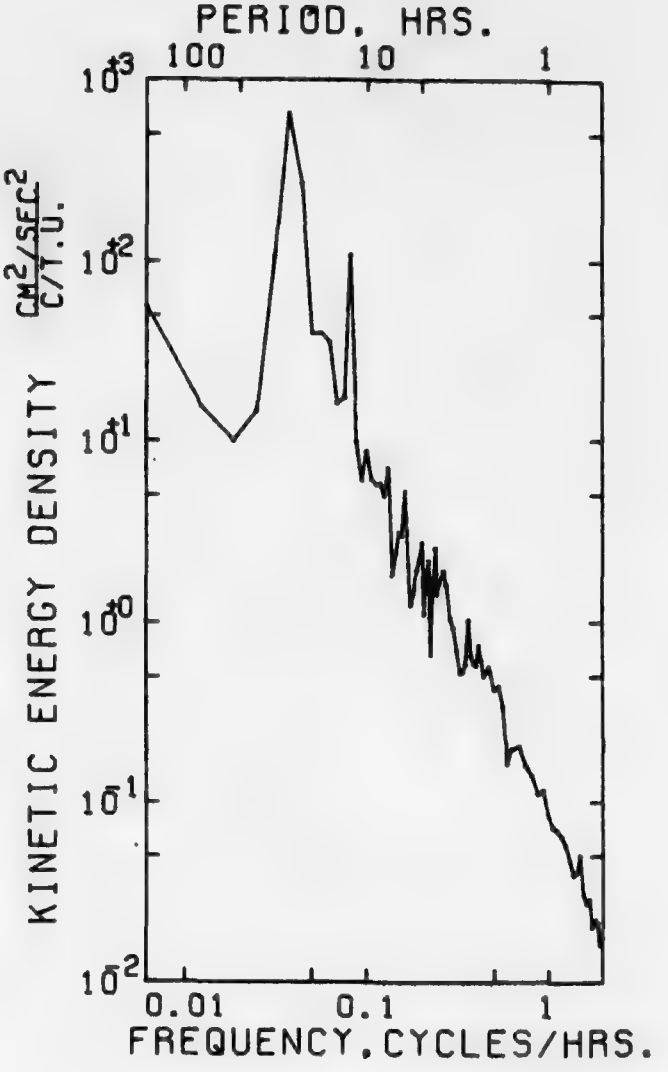
*** TEMPERATURE ***
*** DEGREES C. ***

MEAN = 4.576 STD ERR = .001
VARIANCE = .062
STD. DEV. = .249
KURTOSIS = 2.717
SKEWNESS = -.003

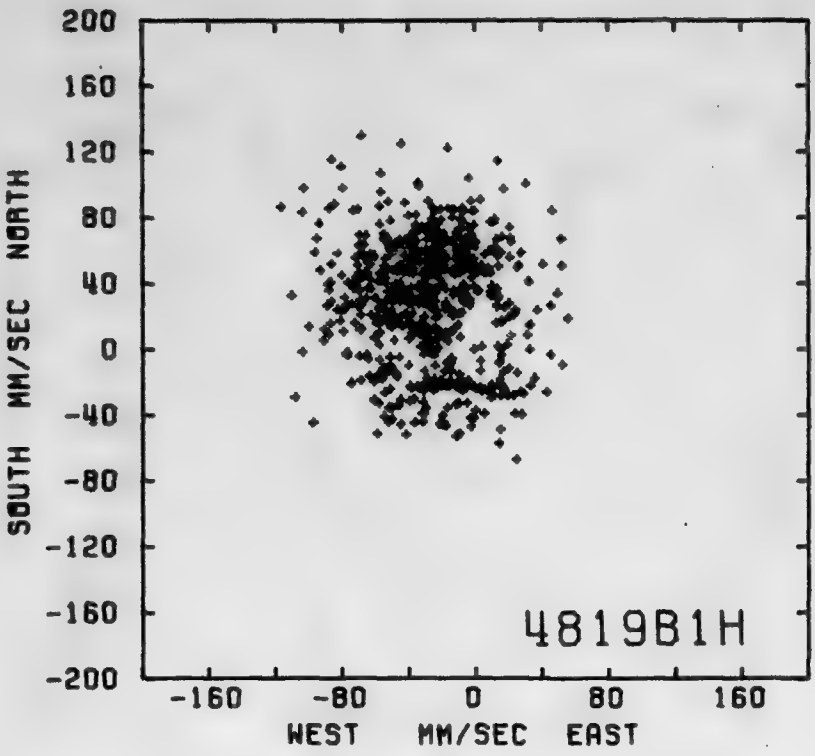
SAMPLE SIZE = 2628 POINTS

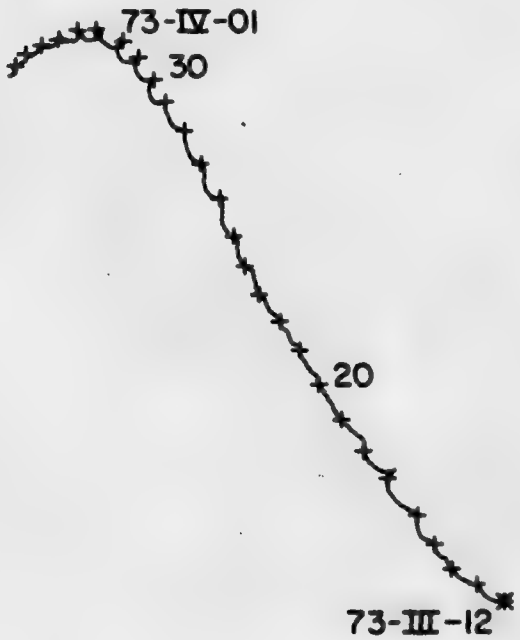


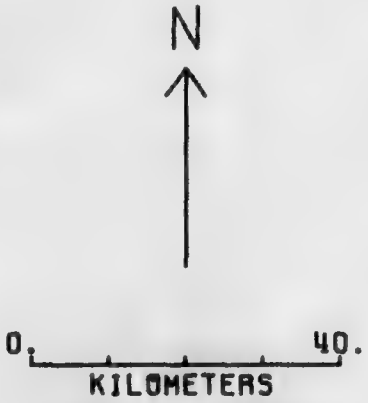
AUTO SPECTRUM
48198900 TEMPERATURE
1392 METERS
73-III-11 TO 73-IV-06
1 PIECES WITH 1296 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
48198900 EAST
48198900 NORTH
1392 METERS
73-III-11 TO 73-IV-07
1 PIECES WITH 1296 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS



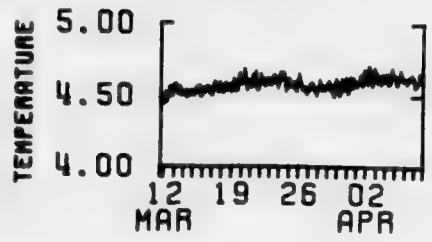


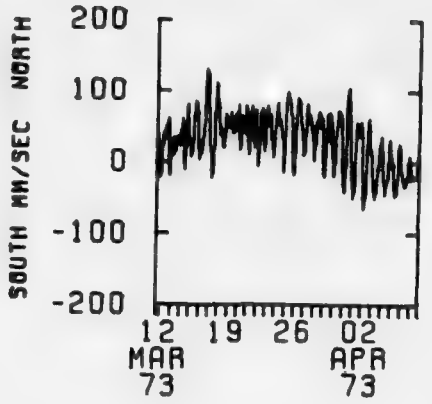


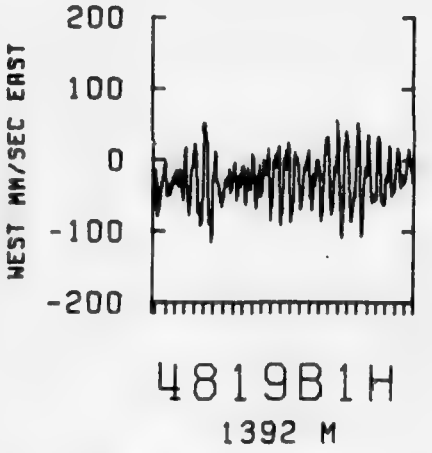
4819B900

1392 M

73- III-12 TO 73- IV -07


TEMPERATURE
5.00
4.50
4.00
12
19
26
02
MAR
APR


SOUTH MM/SEC NORTH
200
100
0
-100
-200
12
19
26
02
MAR
73
APR
73


WEST MM/SEC EAST
200
100
0
-100
-200
4819B1H
1392 M
DIRECTION
360
180
0
SPEED MM/SEC
200
100
0
12
19
26
02
MAR
73
APR
73

DATA NUMBER 481,12

Instrument No.: V-0119 Type: Vector Averaging Current Meter

Depth: 2916 m Water Depth: 5462 m

Start time: 73-March-11 11.07.30.

Stop time: 73-April-11 08.52.30.

Duration: 30d 21h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

Compass - good

Vane - progressively stickier March 31 to April 15, stuck April 29 to June 9

Rotor - looks good but the last events did not show up in the deck data

Temperature - good

STATS DATA/ 481.12S000R

	EAST	NORTH	SPEED		EAST & NORTH	
MEAN =	-23.65	26.79	48.89	= COVARIANCE =		47.11
STD. ERR. =	.32	.64	.32	= STD. ERR. OF COVARIANCE =		18.43
VARIANCE =	308.30	1206.37	288.80	= STD. DEV. OF COVARIANCE =		1058.48
STD. DEV. =	17.50	34.73	17.22	= CORRELATION COEFFICIENT =		.078
KURTOSIS =	2.71	2.18	2.18	= VECTOR MEAN =		35.87
SKEWNESS =	-.08	-.54	.21	= VECTOR VARIANCE =		758.34
				= STD. DEV. =		27.50

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 2968 POINTS

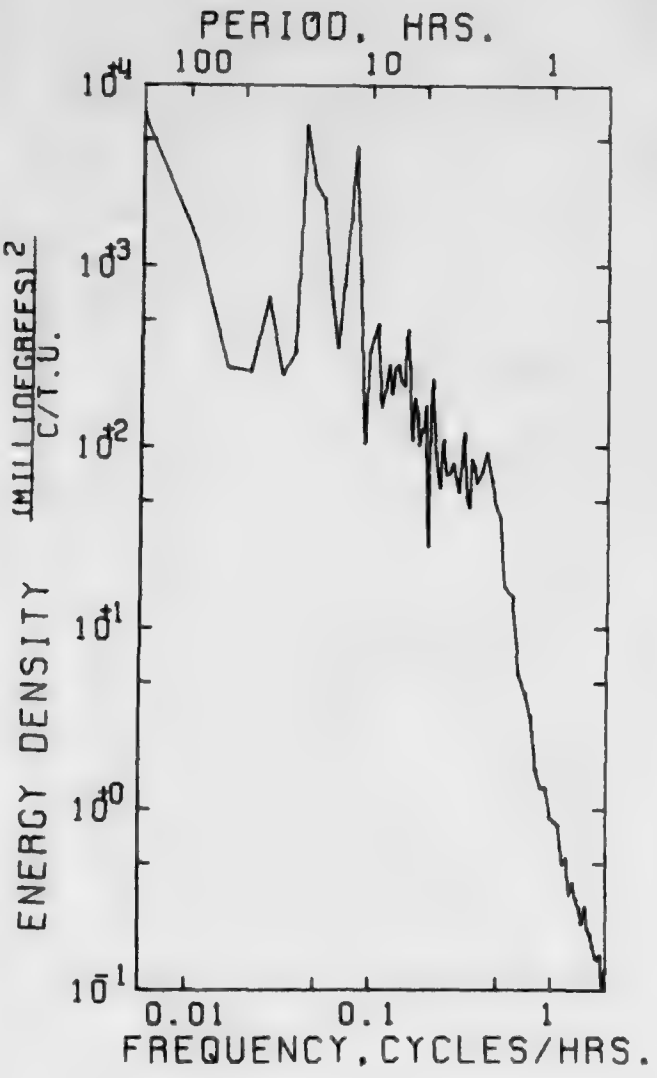
*** TEMPERATURE ***
*** DEGREES C. ***

SPANNING RANGE
FROM 73- III-11 11.07.30
TO 73- IV -11 08.52.30

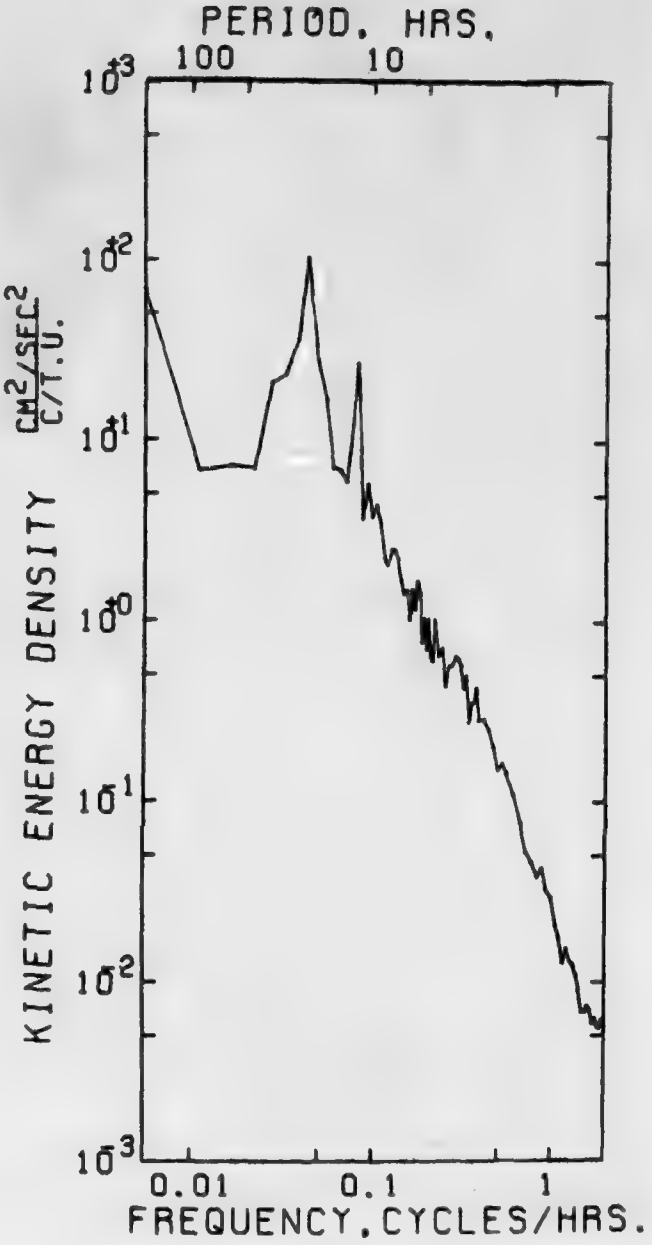
DURATION 30 DAYS 21 H 45 M

MEAN =	2.758	STD ERR =	.000
VARIANCE =	.000		
STD. DEV. =	.019		
KURTOSIS =	2.751		
SKEWNESS =	-.329		

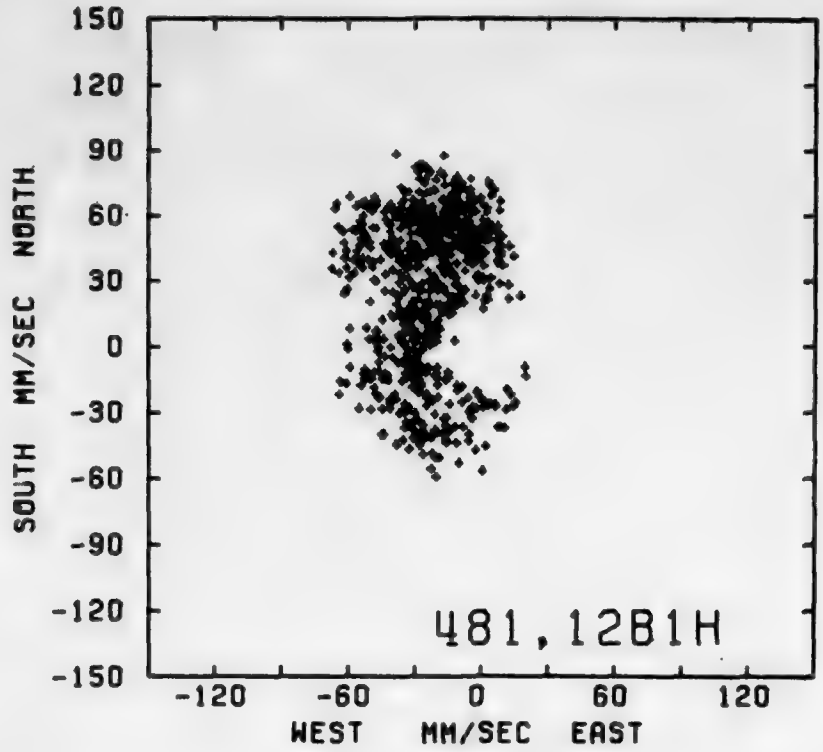
SAMPLE SIZE = 2968 POINTS



AUTO SPECTRUM
481,128900 TEMPERATURE
2916 METERS
73-III-11 TO 73-IV-10
1 PIECES WITH 1458 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS



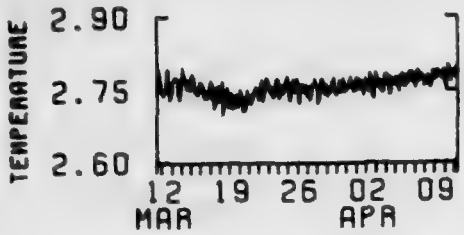
AUTO SPECTRUM
481,128900 EAST
481,128900 NORTH
2916 METERS
73-III-11 TO 73-IV-10
1 PIECES WITH 1458 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS

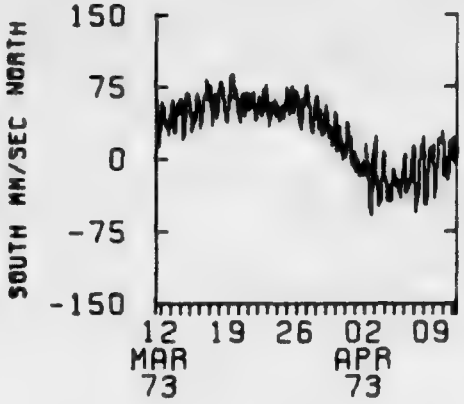


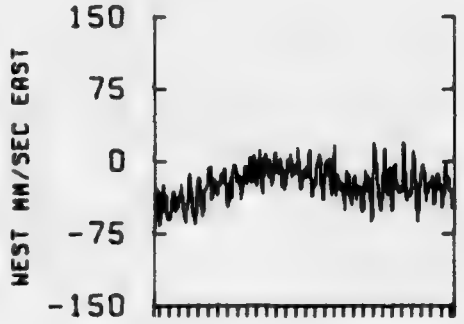
481,12B900

2916 M

73- III-12 TO 73- IV -11

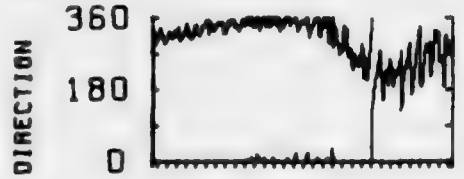


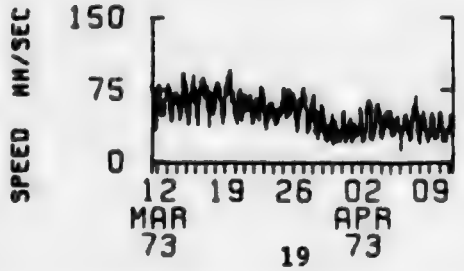




481,12B1H

2916 M





DATA NUMBER 481,15

Data number 481.15

Instrument No.: M-218

Type: Geodyne 850 current meter

Depth: 3963 m

Water depth: 5462 m

Start time: 73-March-11 05.19.42.

Stop time: 73-July-04 09.49.42.

Duration: 115d 4h 30m

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 13

recording interval = 1800 seconds

COMMENTS:

Instrument owned by the University of Rhode Island

Compass - good

Vane - good

Rotor count - minor order bit problem which will probably not affect the vector averages

Clock - mechanical clock not crystal clock. Computed rotor event time occurs 1 1/2 hours sooner than the real rotor event time. No time adjustmant made.

STATS

DATA/ 481.1501800R

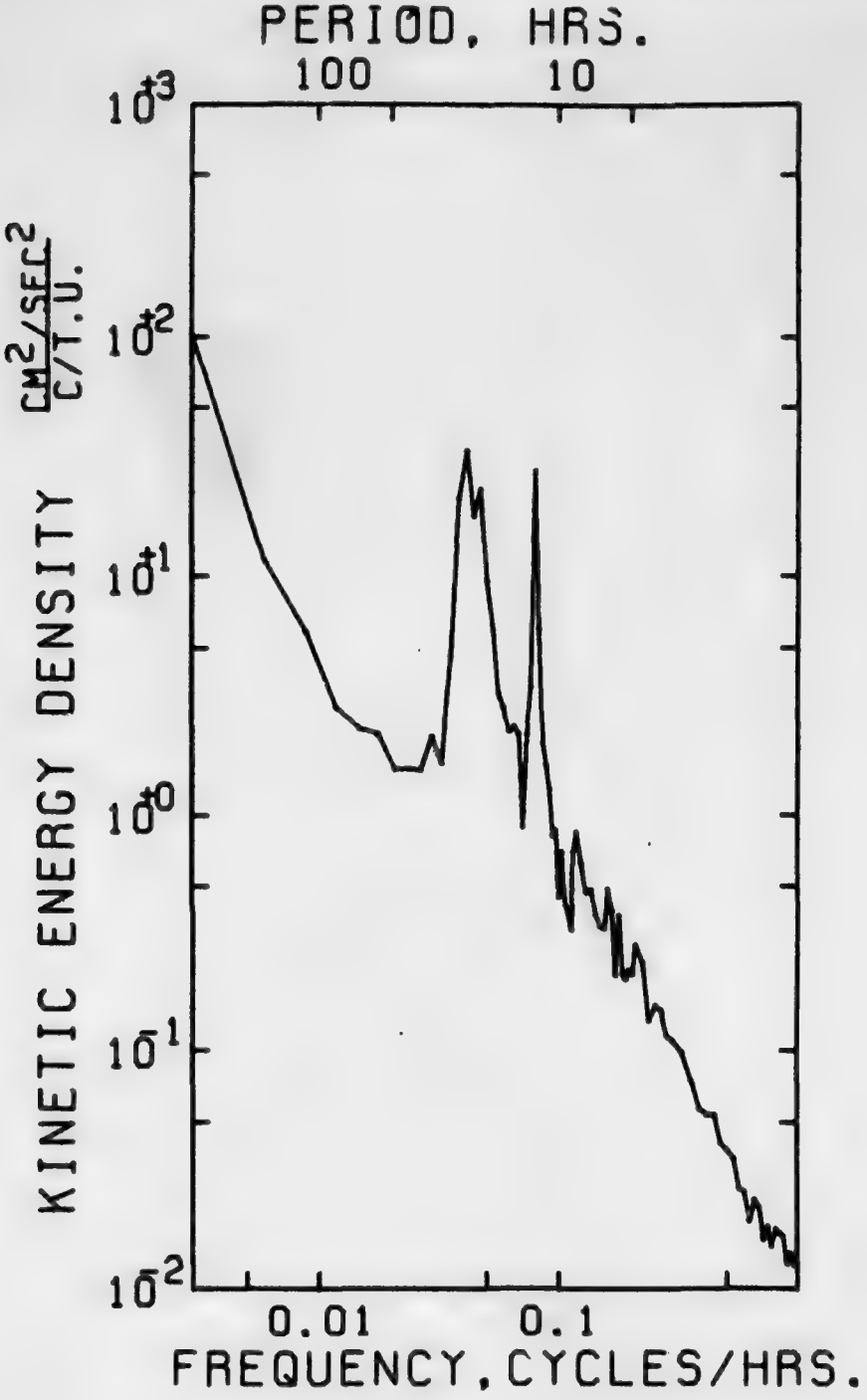
	EAST	NORTH	SPEED	EAST & NORTH	
MEAN =	2.43	3.27	26.46	COVARIANCE =	82.55
STD. ERR. =	.23	.26	.07	STD. ERR. OF COVARIANCE =	3.69
VARIANCE =	281.38	378.58	20.88	STD. DEV. OF COVARIANCE =	274.48
STD. DEV. =	16.77	19.48	5.47	CORRELATION COEFFICIENT =	.253
KURTOSIS =	1.61	1.83	3.05	VECTOR MEAN =	4.07
SKEWNESS =	-.08	-.14	.81	VECTOR VARIANCE =	330.48
				STD. DEV. =	18.18

UNITS OF RAW DATA VARIABLES = MM/SEC

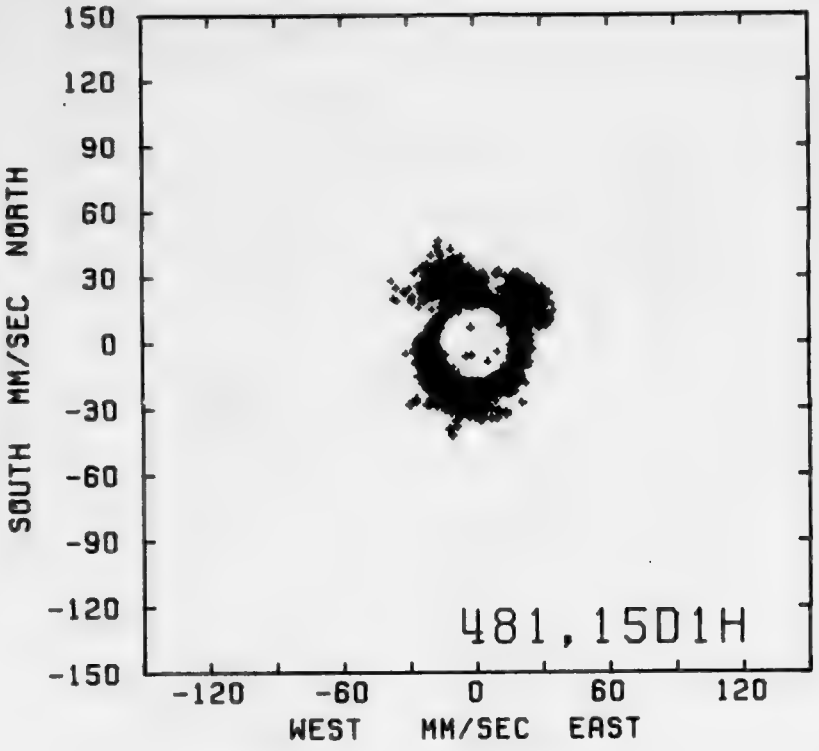
SAMPLE SIZE = 5890 POINTS

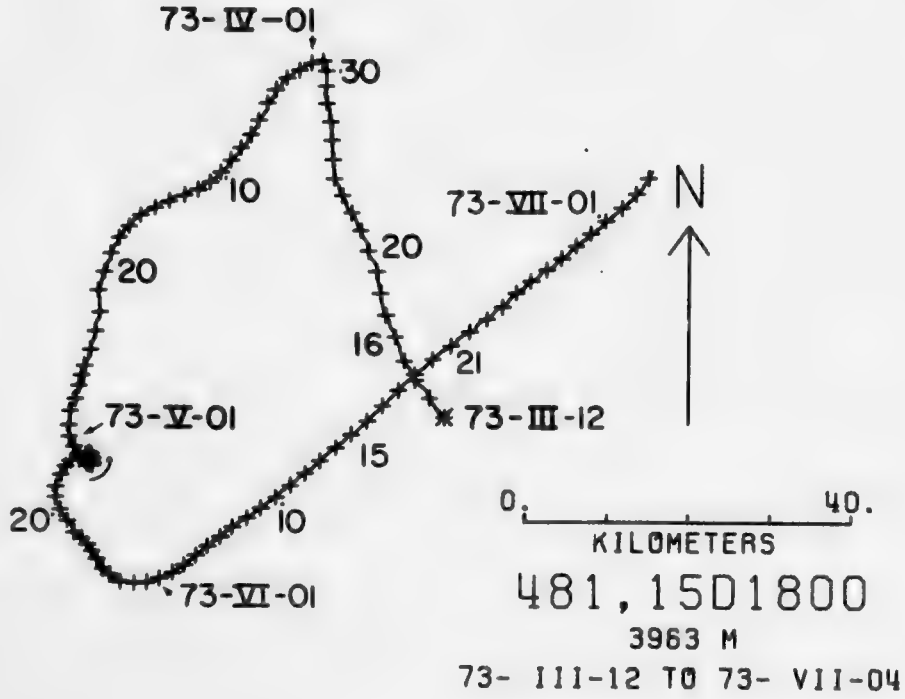
SPANNING RANGE
FROM 73- III-11 05.19.42
TO 73- VII-04 09.49.42

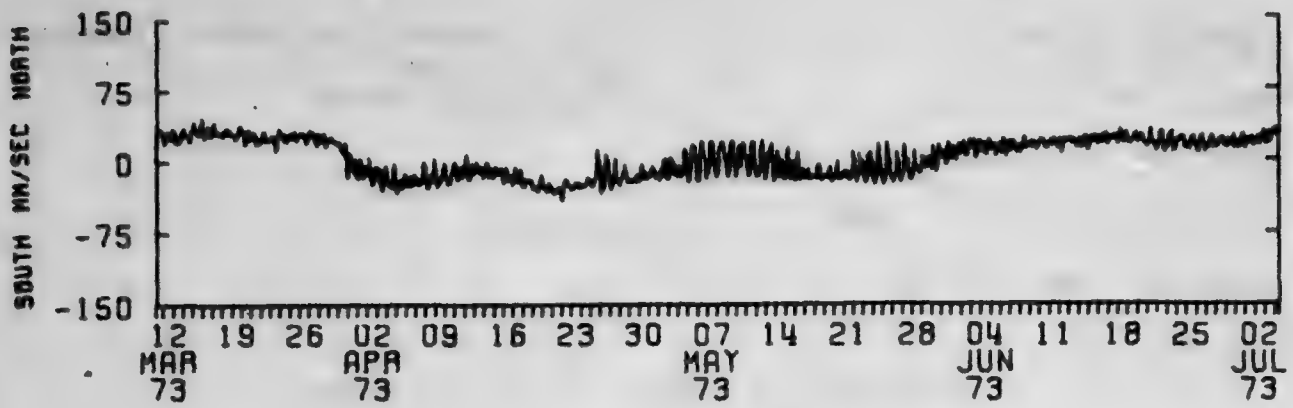
DURATION 115 DAYS 4 H 30 M 0 S

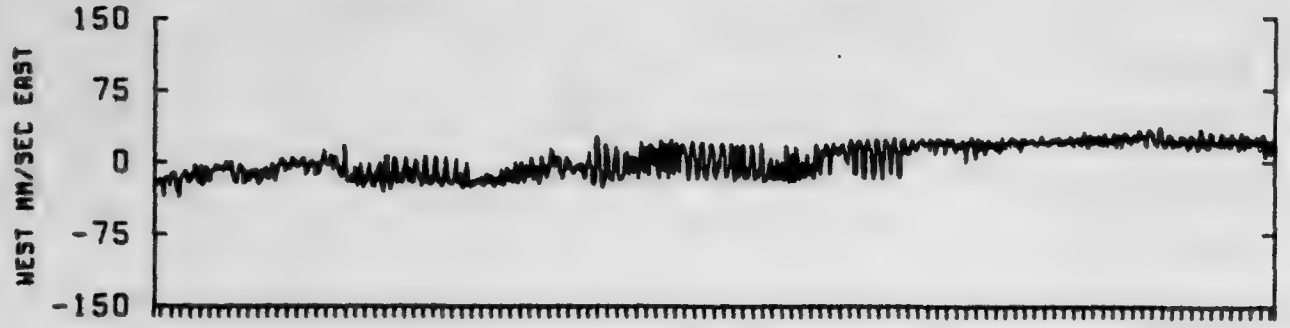


AUTO SPECTRUM
481.15D1800 EAST
481.15D1800 NORTH
3963 METERS
73-III-11 TO 73-VII-01
1 PIECES WITH 2700 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS


150
120
90
60
30
0
-30
-60
-90
-120
-150
SOUTH MM/SEC NORTH
-120
-60
0
60
120
WEST
MM/SEC
EAST
481,15D1H

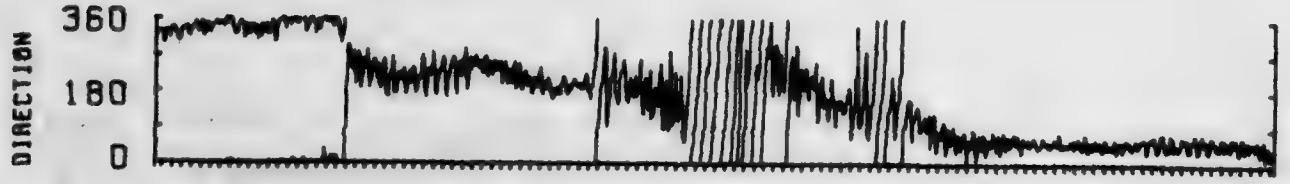

73-IV-01
30
10
20
73-VII-01
N
20
16
21
73-V-01
73-III-12
15
20
10
73-VI-01
0.
40.
KILOMETERS
481,15D1800
3963 M
73- III-12 TO 73- VII-04

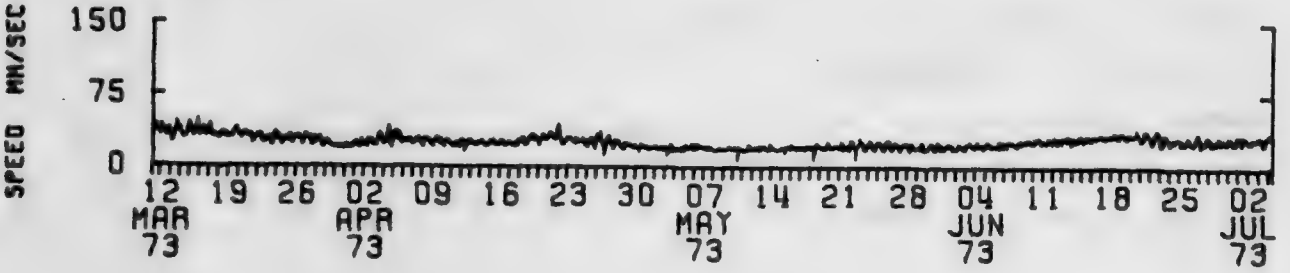




481,1501H

3963 M





DATA NUMBER 481,18

Instrument No.: M-221

Type: Magnetic Tape Recording Current Meter

Depth: 5356 m

Water depth: 5462 m

Start time: 73-March-11 05.20.32.

Stop time: 73-July-04 08.50.32.

Duration: 115d 3h 30m

Sampling scheme: Interval

time between strobes = 5 seconds

no. of strobes per interval = 13

recording interval = 1800 seconds

COMMENTS:

Instrument owned by the University of Rhode Island

Compass - good

Vane - good

Rotor count - a stuck low order bit which probably will not affect the vector averages

Clock - mechanical clock not crystal clock. Computed rotor event time occurs 2 hours sooner than the real rotor event time. No time adjustment made.

STATS

DATA/ 481.18018000A

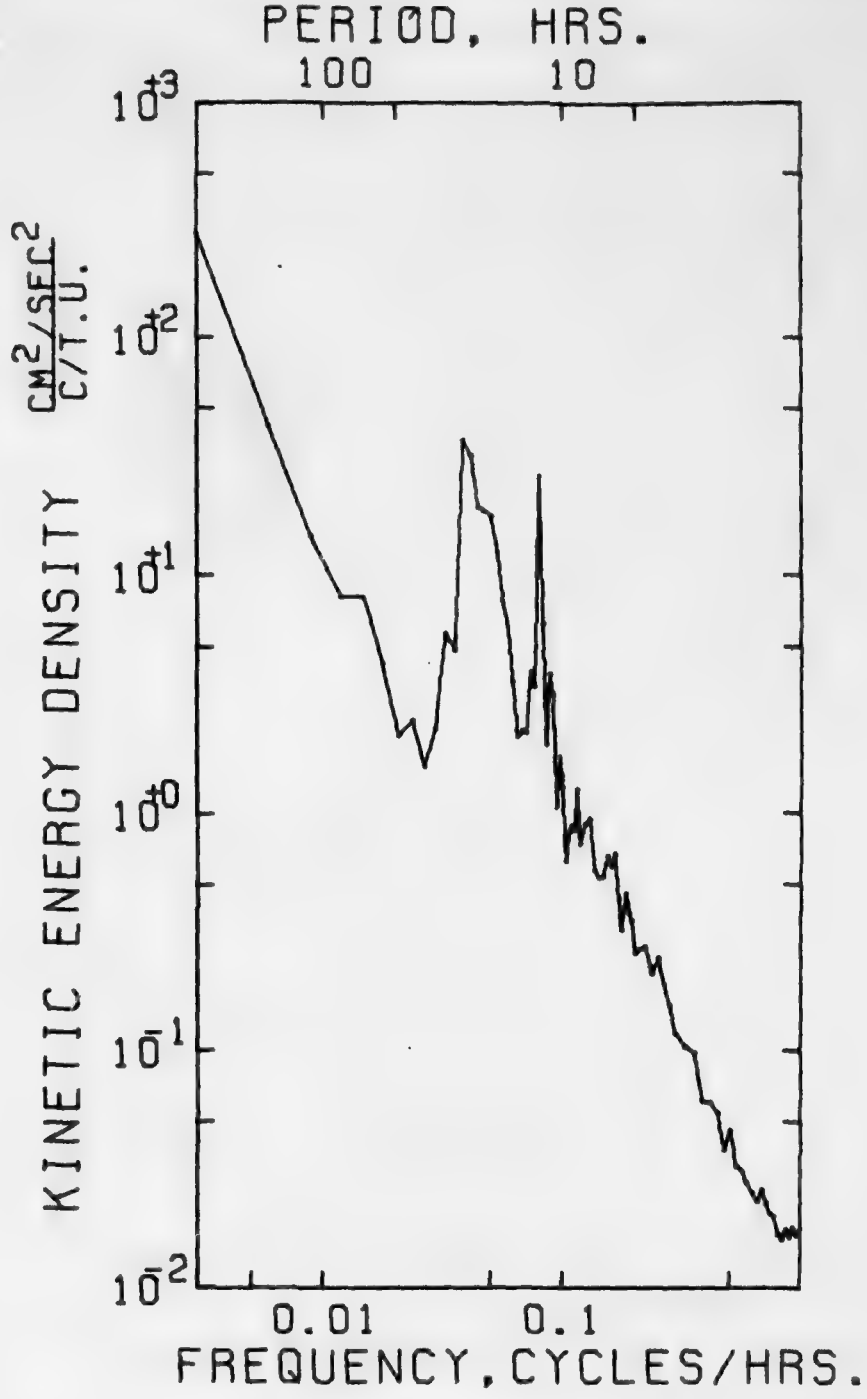
	EAST	NORTH	SPEED		EAST & NORTH	
MEAN =	5.30	9.19	29.75	= COVARIANCE =		67.07
STD. ERR. =	.25	.31	.13	= STD. ERR. OF COVARIANCE =		5.54
VARIANCE =	345.16	518.47	90.99	= STD. DEV. OF COVARIANCE =		412.21
STD. DEV. =	18.58	22.77	9.54	= CORRELATION COEFFICIENT =		.158
KURTOSIS =	2.15	2.08	8.81	= VECTOR MEAN =		10.80
SKEWNESS =	-.14	-.09	1.29	= VECTOR VARIANCE =		431.82
				= STD. DEV. =		20.78

UNITS OF RAW DATA VARIABLES = MM/SEC

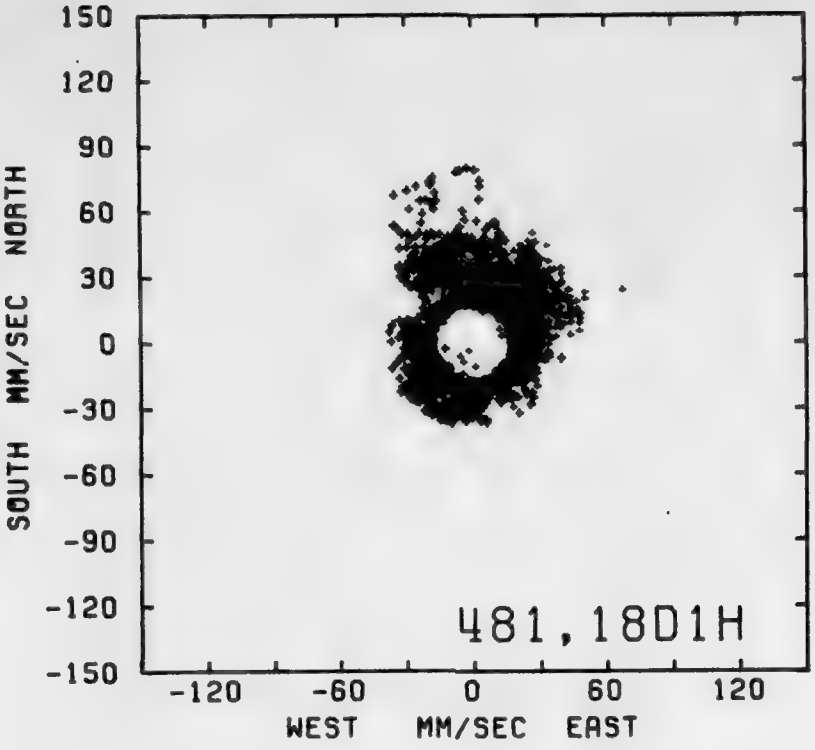
SAMPLE SIZE = 5528 POINTS

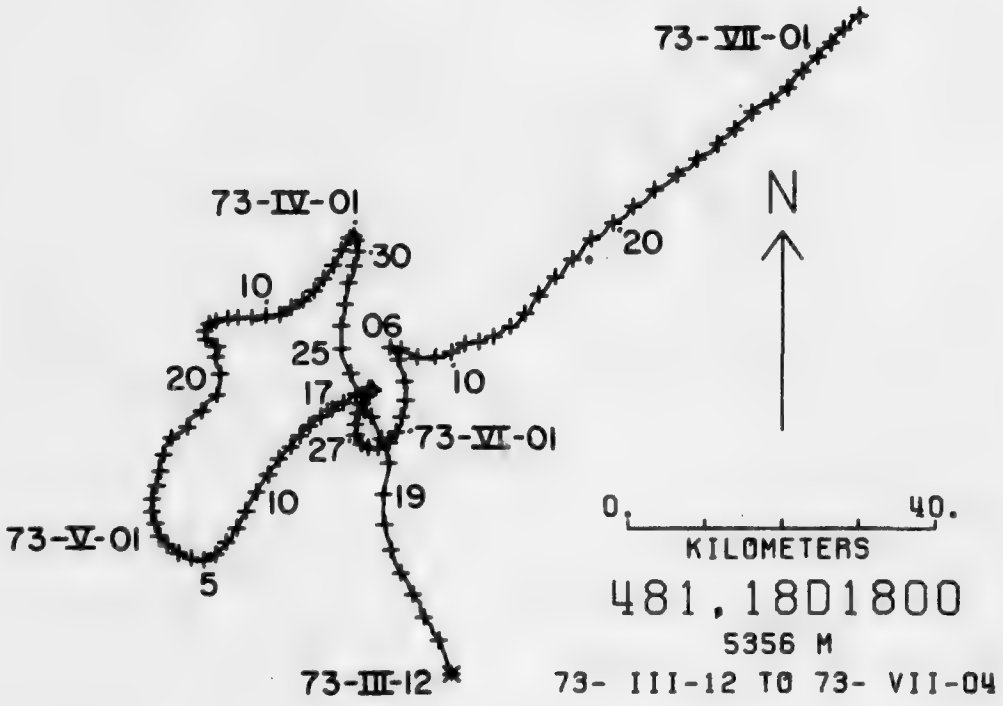
SPANNING RANGE
FROM 73- III-11 05.20.32
TO 73- VII-04 08.50.32

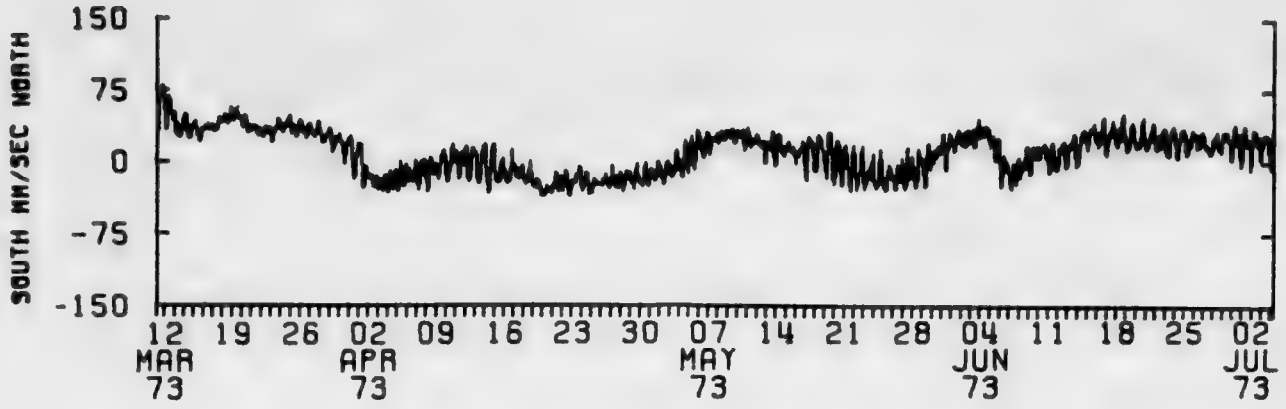
DURATION 115 DAYS 3 H 30 M 0 S

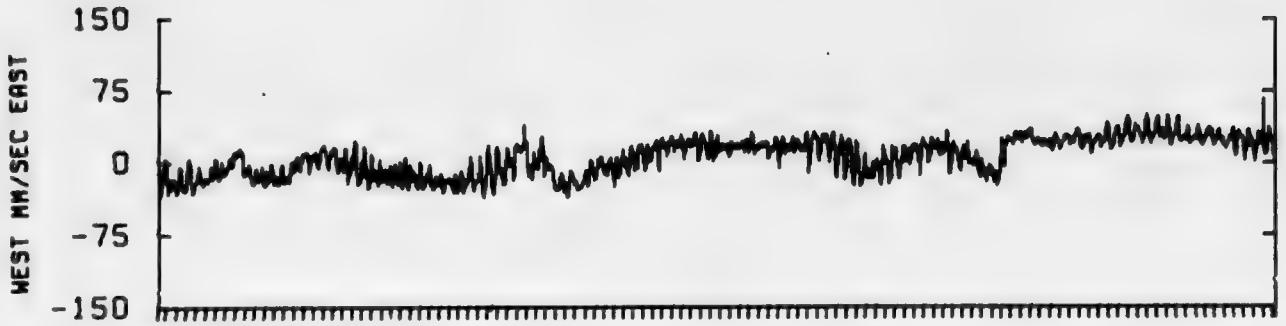


AUTO SPECTRUM
481.18D1800 EAST
481.18D1800 NORTH
5356 METERS
73-III-11 TO 73-VII-01
1 PIECES WITH 2700 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS


150
120
90
60
30
0
-30
-60
-90
-120
-150
SOUTH MM/SEC NORTH
-120
-60
0
60
120
WEST MM/SEC EAST
481,18D1H

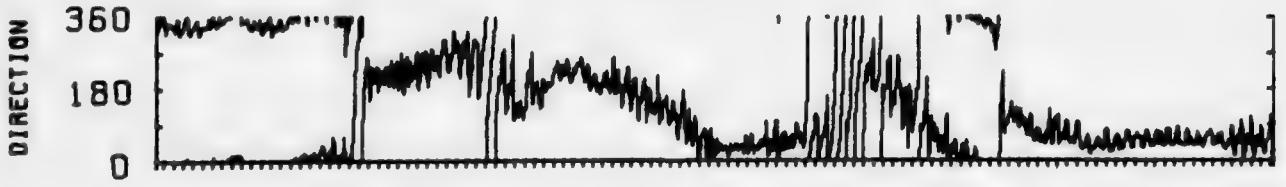

73-VII-01
73-IV-01
30
10
06
25
20
17
10
20
73-VI-01
27
10
19
73-V-01
5
73-III-12
N
0.
40.
KILOMETERS
481,18D1800
5356 M
73- III-12 TO 73- VII-04

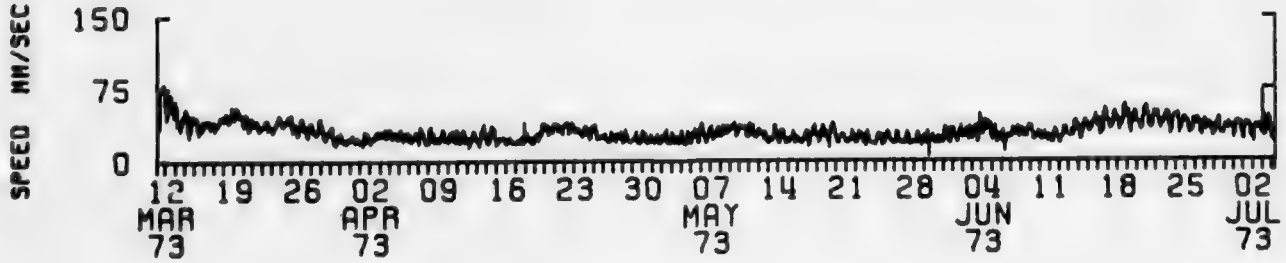




481,18D1H

5356 M





Mooring No. 482

Set 1973 Mar 12 — 28° 09.3'N — 68° 39.3'W
Year Month Day — Latitude — Longitude

Set by J. Gifford - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 1

Retrieved 1973 June 26
Year Month Day

Retrieved by J. Gifford - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 6

Purpose of Mooring: Mooring #8 of MODE 1 array

Mooring Type: Subsurface mooring

Key	Data Number	Instrument Number	Type	Depth Meters	Comments
+	4821	V-0121	VACM	406	
▮	4822	#15	T/P	507	M.I.T.
+	4823	V-0130	VACM	706	I.O.S.
▮	4824	#54	T/P	911	M.I.T.
+	4825	V-0135	VACM	1411	
*	4826	V-0126	VACM	2936	
*	4827	V-0165	VACM	3957	
	4828	H-275	FCM	5128	Nova University, Florida
	Water depth			5239	

COMMENTS ON MOORING:

STATION 482

RADIO FLOAT WITH LIGHT
2 m 1/2" CHAIN
2 m 3/8" CHAIN
14 16" GLASS BALLS IN HARD HATS ON 14 m 3/8" CHAIN
CORROSION SAMPLE
VACM — 4821
2 m 3/8" CHAIN
96 m 3/16" WIRE
2 m 3/8" CHAIN
T/P — 4822
196 m 3/16" WIRE
VACM — 4823
2 m 3/8" CHAIN
198 m 3/16" WIRE
CORROSION SAMPLE
2 m 3/8" CHAIN
T/P — 4824
199 m 3/16" WIRE
280 m 3/16" WIRE
10 16" GLASS BALLS IN HARD HATS ON 15 m 3/8" CHAIN
VACM — 4825
500 m 3/16" WIRE
45 m 3/8" DACRON
3/8" DACRON
(CONTINUED)
456 m
457 m
6 16" GLASS BALLS IN HARD HATS ON 6 m 3/8" CHAIN
VACM — 4826
CORROSION SAMPLE
38 m
459 m
455 m
VACM — 4827
170 m
457 m
457 m
CURRENT METER — 4828
57 m
17 16" GLASS BALLS IN HARD HATS ON 17 m 3/8" CHAIN
CORROSION SAMPLE
ACOUSTIC RELEASE
20 m 3/4" NYLON
3 m 1/2" CHAIN
STIMSON ANCHOR .2550 LBS.

DATA NUMBER 4826

Instrument No.: V-0126 Type: Vector Averaging Current Meter

Depth: 2936 m Water Depth: 5239 m

Start time: 73-March-12 11.07.30.

Stop time: 73-April-06 23.52.30,

Duration: 25d 12h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

Compass - good

Vane - sticking from April 7 to May 8, stuck from May 8 to recovery

Rotor - at threshold from May 8 to end

Temperature - good

STATS DATA/ 4826S00A

	EAST	NORTH	SPEED	##### EAST & NORTH	#####
MEAN =	6.42	-44.89	50.00	COVARIANCE =	-139.40
STD. ERR. =	.38	.46	.42	STD. ERR. OF COVARIANCE =	22.26
VARIANCE =	372.82	518.00	442.05	STD. DEV. OF COVARIANCE =	1102.45
STD. DEV. =	19.31	22.76	21.03	CORRELATION COEFFICIENT =	-.317
KURTOSIS =	3.78	3.15	2.71	VECTOR MEAN =	45.28
SKEWNESS =	.85	.07	.80	VECTOR VARIANCE =	445.48
				STD. DEV. =	21.11

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 2452 POINTS

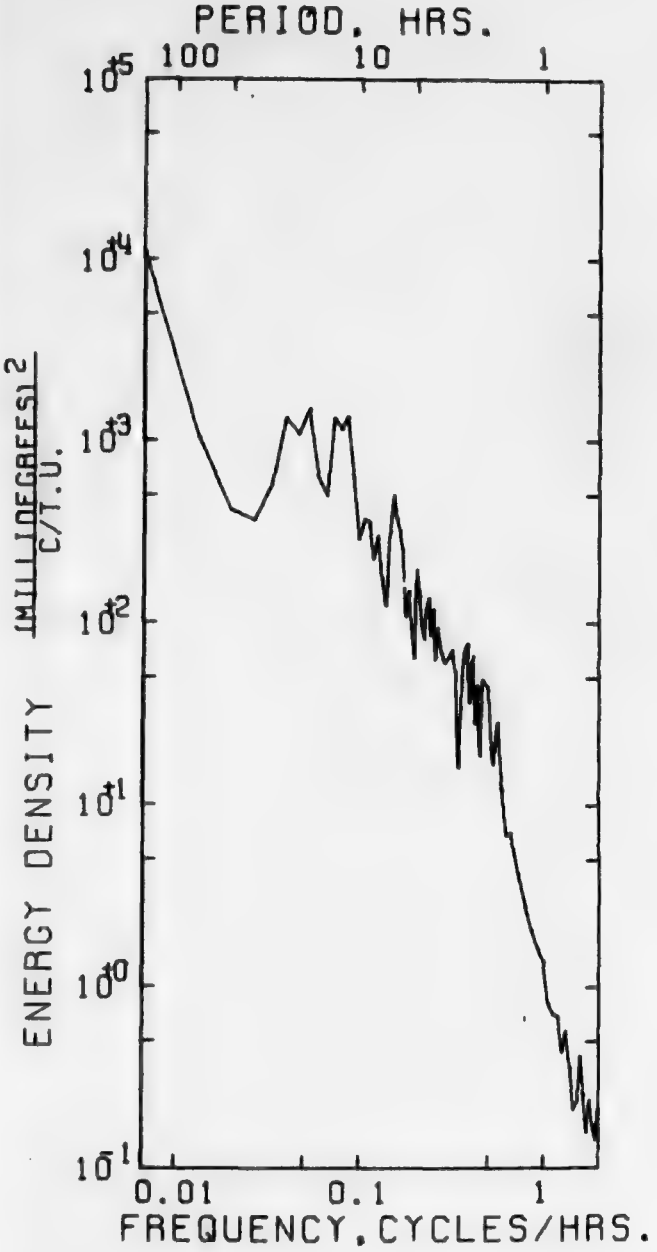
SPANNING RANGE
FROM 73- III-12 11.07.30
TO 73- IV -06 23.52.30

DURATION 25 DAYS 12 H 45 M

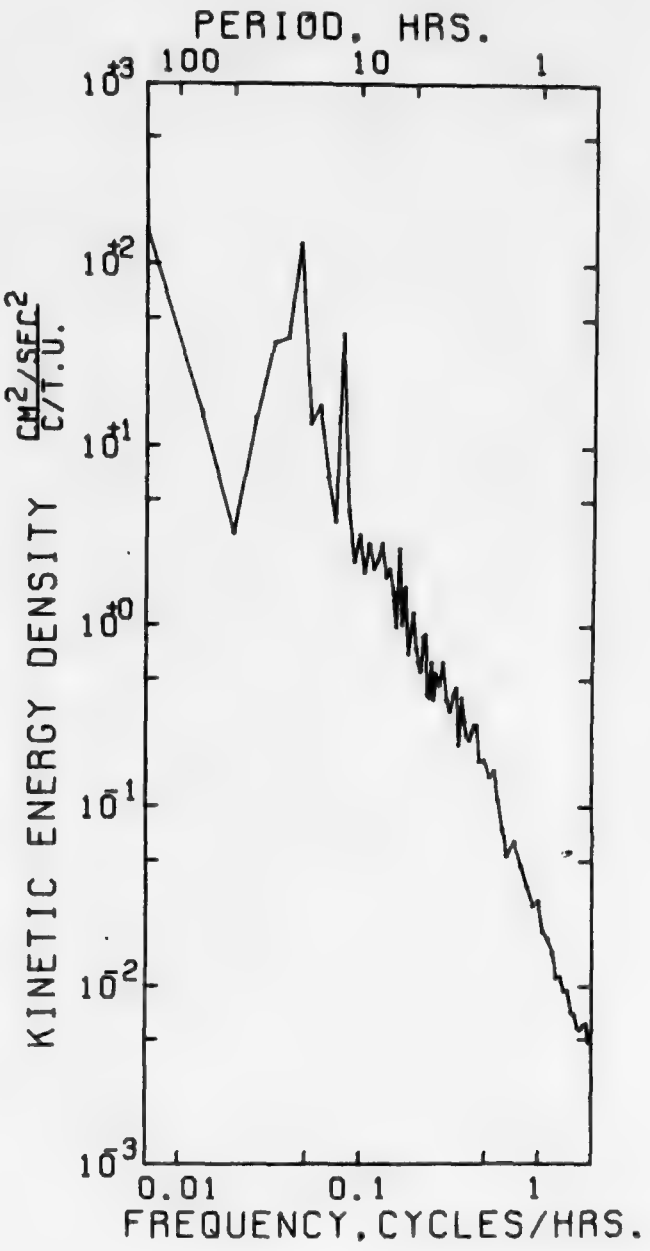
*** TEMPERATURE ***
*** DEGREES C. ***

MEAN =	2•790	STD ERR =	•00C
VARIANCE =	•000		
STD• DEV•=	•C15		
KURTOSIS =	2•959		
SKEWNESS =	-•006		

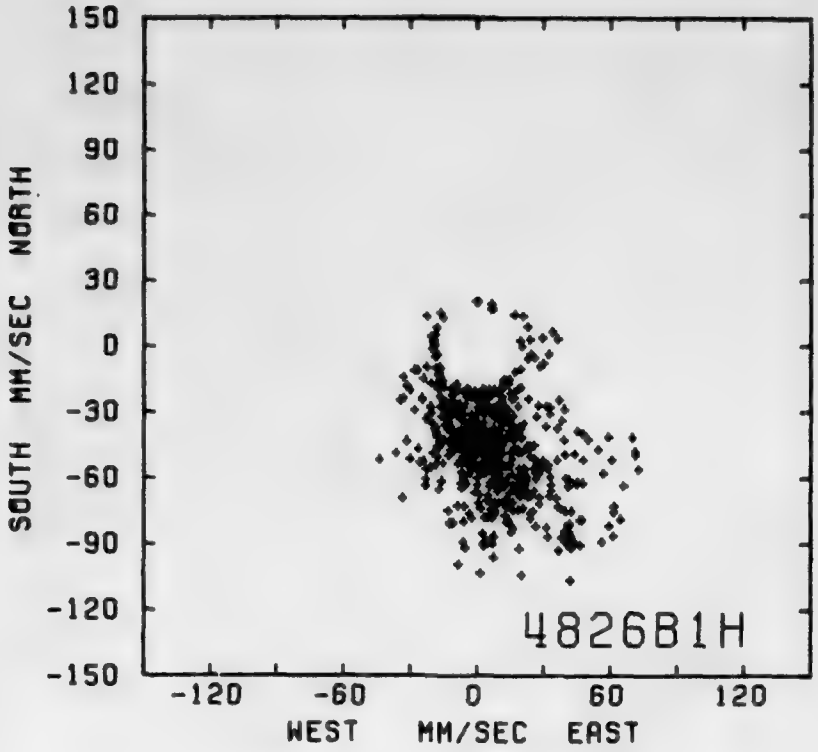
SAMPLE SIZE = 2452 POINTS

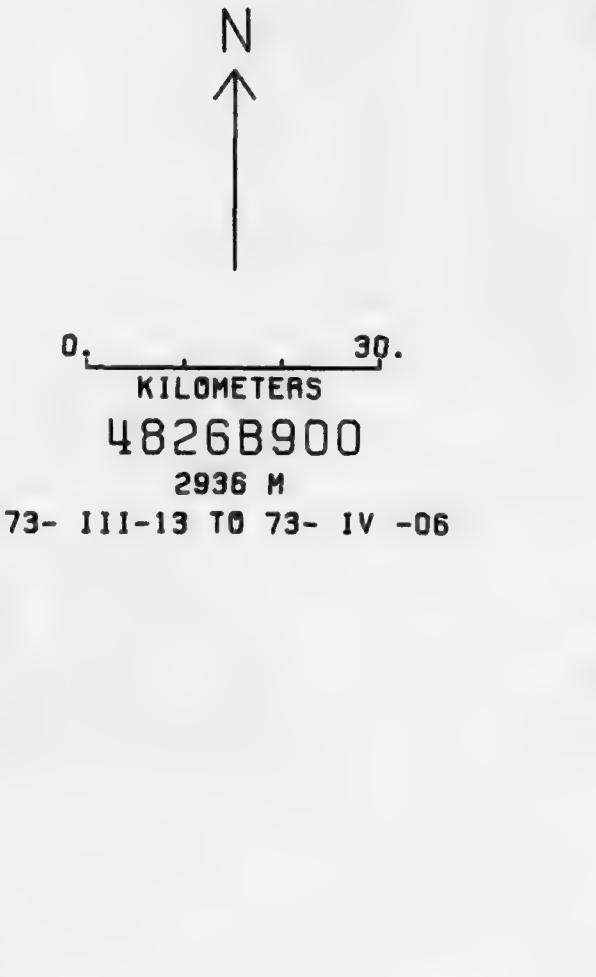


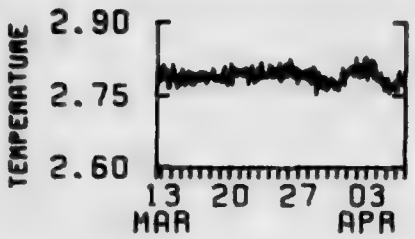
AUTO SPECTRUM
48268900 TEMPERATURE
2936 METERS
73-III-12 TO 73-IV-06
1 PIECES WITH 1215 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS

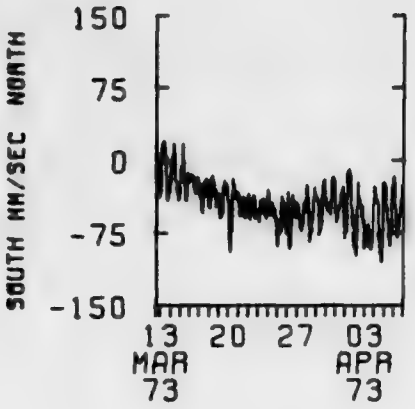


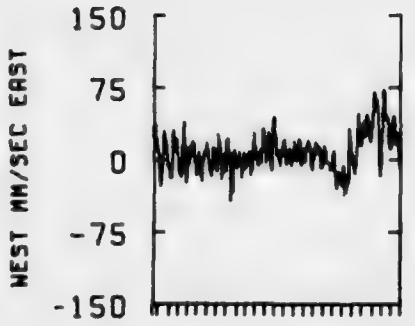
AUTO SPECTRUM
48268900 EAST
48268900 NORTH
2936 METERS
73-III-12 TO 73-IV-06
1 PIECES WITH 1215 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS


150
120
90
60
30
0
-30
-60
-90
-120
-150
SOUTH MM/SEC NORTH
-120
-60
0
60
120
WEST MM/SEC EAST
4826B1H


N
0.
30.
KILOMETERS
4826B900
2936 M
73- III-13 TO 73- IV -06
73-III-13
20
30
73-IV-01

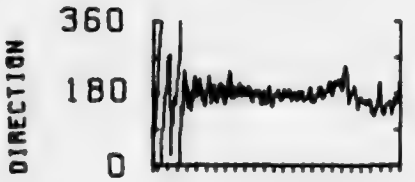


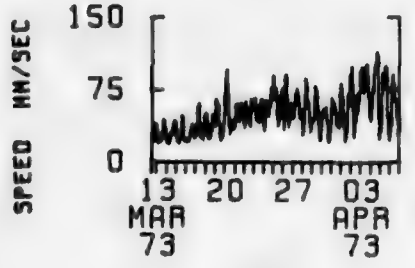




4826B1H

2936 M





DATA NUMBER 4827

Instrument No.: V-0165 Type: Vector Averaging Current Meter

Depth: 3957 m Water Depth: 5239 m

Start time: 73-March-12 10.07.30.

Stop time: 73-April-09 11.52.30.

Duration: 28d 1h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

Compass - good

Vane - stuck April 9 to April 24 and May 3 to recovery

Rotor -speeds are very low in places, may be real

Temperature - good

STATS DATA/ 48278800C

	EAST	NORTH	SPEED	*****	EAST & NORTH	*****
MEAN =	-6.87	-53.86	56.70	= COVARIANCE =		-27.80
STD. ERR. =	.20	.33	.30	= STD. ERR. OF COVARIANCE =		16.28
VARIANCE =	218.33	288.01	230.85	= STD. DEV. OF COVARIANCE =		845.05
STD. DEV. =	14.78	17.28	15.48	= CORRELATION COEFFICIENT =		-.108
KURTOSIS =	2.77	4.20	2.54	= VECTOR MEAN =		54.28
SKEWNESS =	.20	.58	-.05	= VECTOR VARIANCE =		258.17
				= STD. DEV. =		16.07

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 2686 POINTS

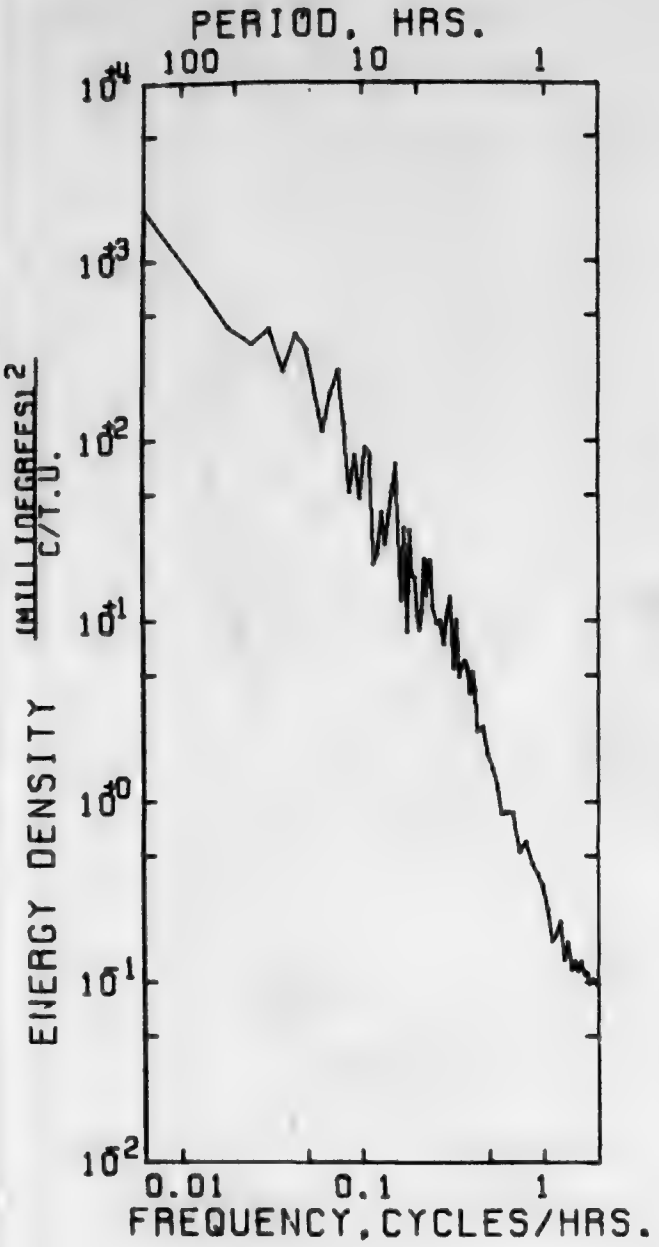
SPANNING RANGE
FROM 73- III-12 10.07.30
TO 73- IV -09 11.52.30

DURATION 28 DAYS 1 H 45 M

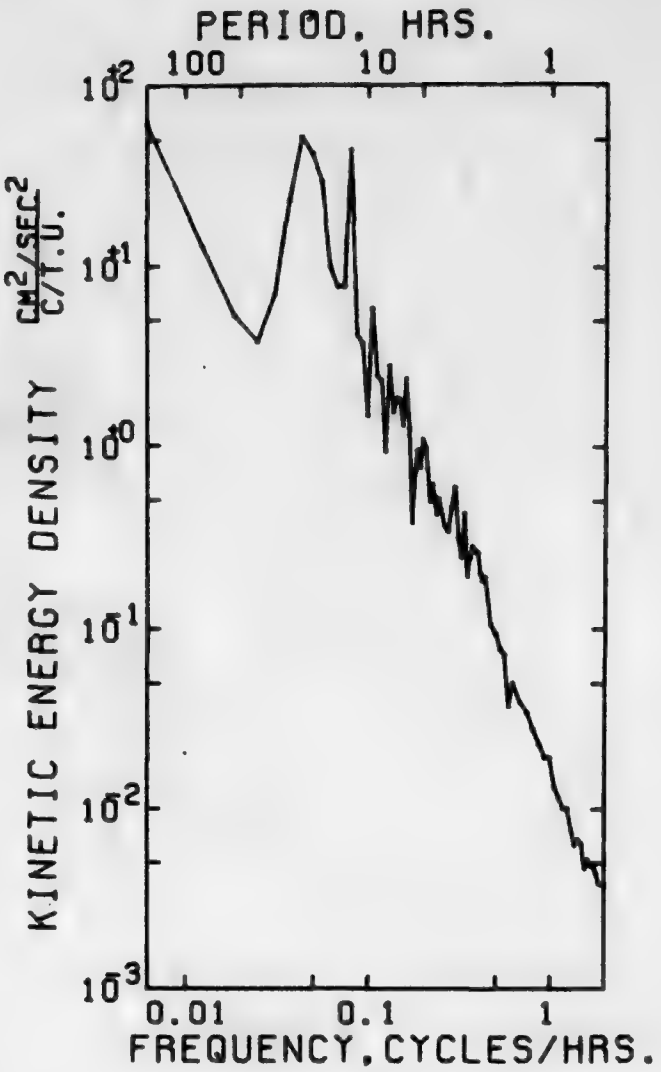
*** TEMPERATURE ***
*** DEGREES C. ***

MEAN =	2.332	STD ERR =	.000
VARIANCE =	.000		
STD. DEV. =	.008		
KURTOSIS =	2.854		
SKEWNESS =	-.546		

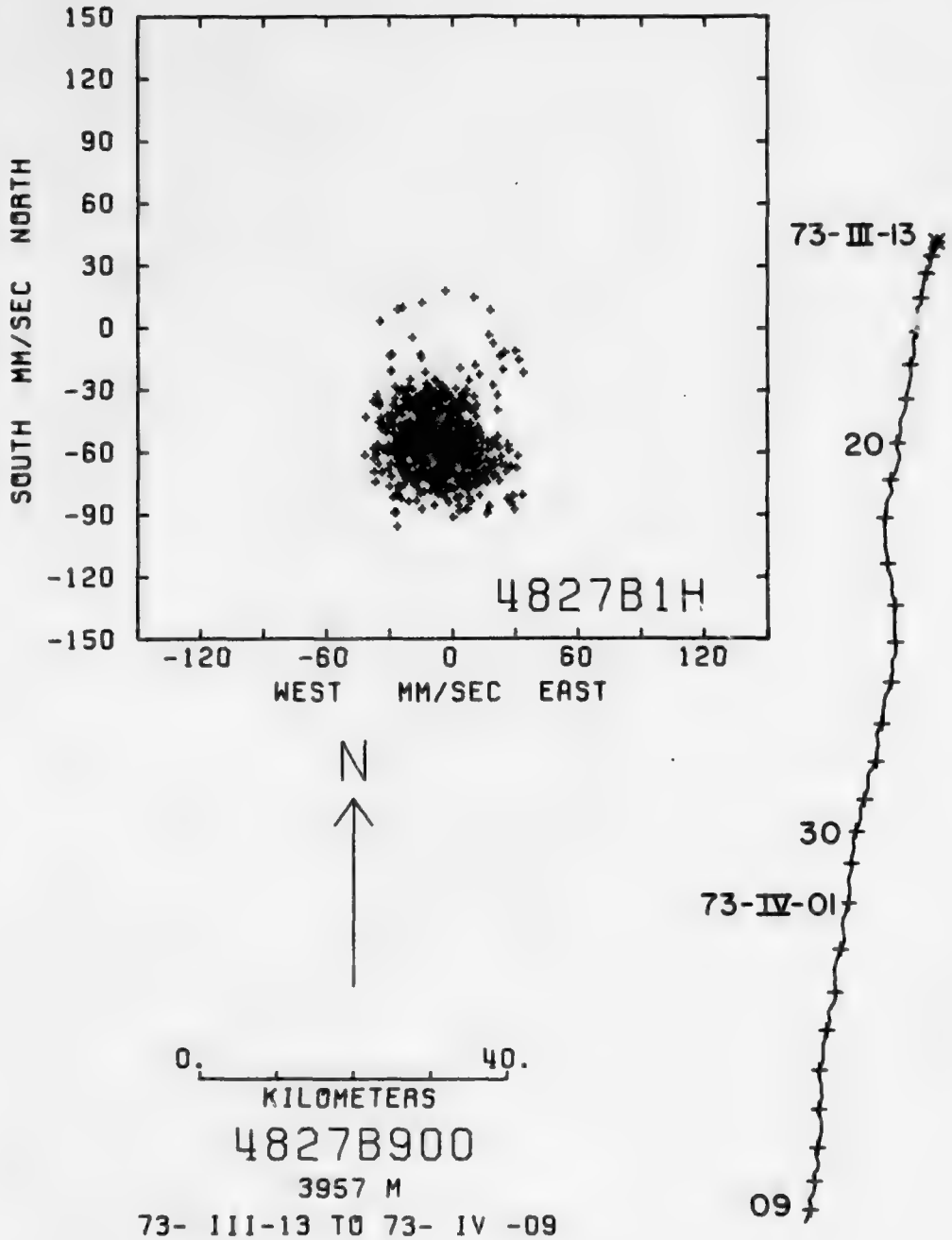
SAMPLE SIZE = 2696 POINTS



AUTO SPECTRUM
48278900 TEMPERATURE
3957 METERS
73-III-12 TO 73-IV-08
1 PIECES WITH 1296 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
48278900 EAST
48278900 NORTH
3957 METERS
73-III-12 TO 73-IV-08
1 PIECES WITH 1296 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS


150
120
90
60
30
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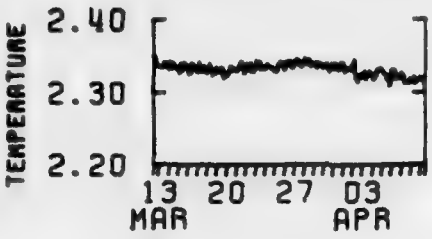
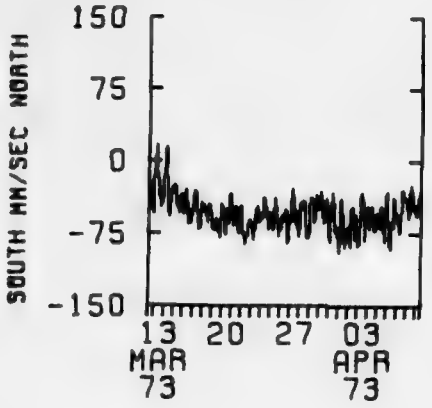
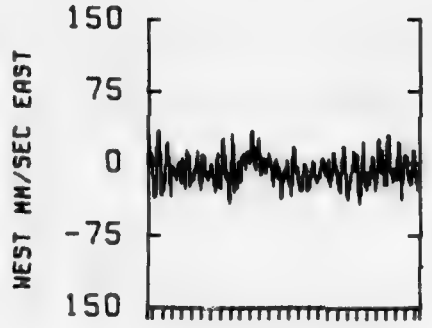
-30
-60
-90
-120
-150
SOUTH MM/SEC NORTH
-120
-60
0
60
120
WEST MM/SEC EAST
4827B1H
N
0.
40.
KILOMETERS
4827B900
3957 M
73- III-13 TO 73- IV -09
73-III-13
20
30
73-IV-01
09

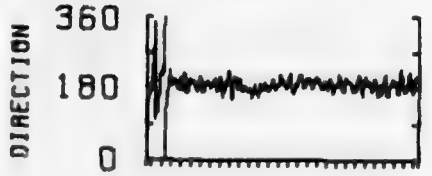


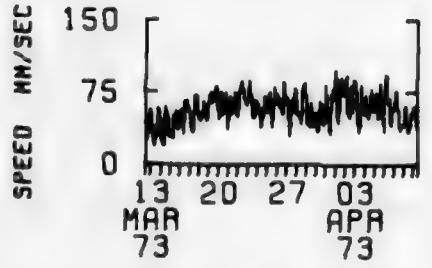




4827B1H

3957 M





Mooring No. 483

Set 1973 Mar 12 (Year Month Day) 29° 02.3'N (Latitude) 68° 13.8'W (Longitude)

Set by G. Tupper - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 1

Retrieved 1973 July 3 (Year Month Day)

Retrieved by J. Gifford - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 6

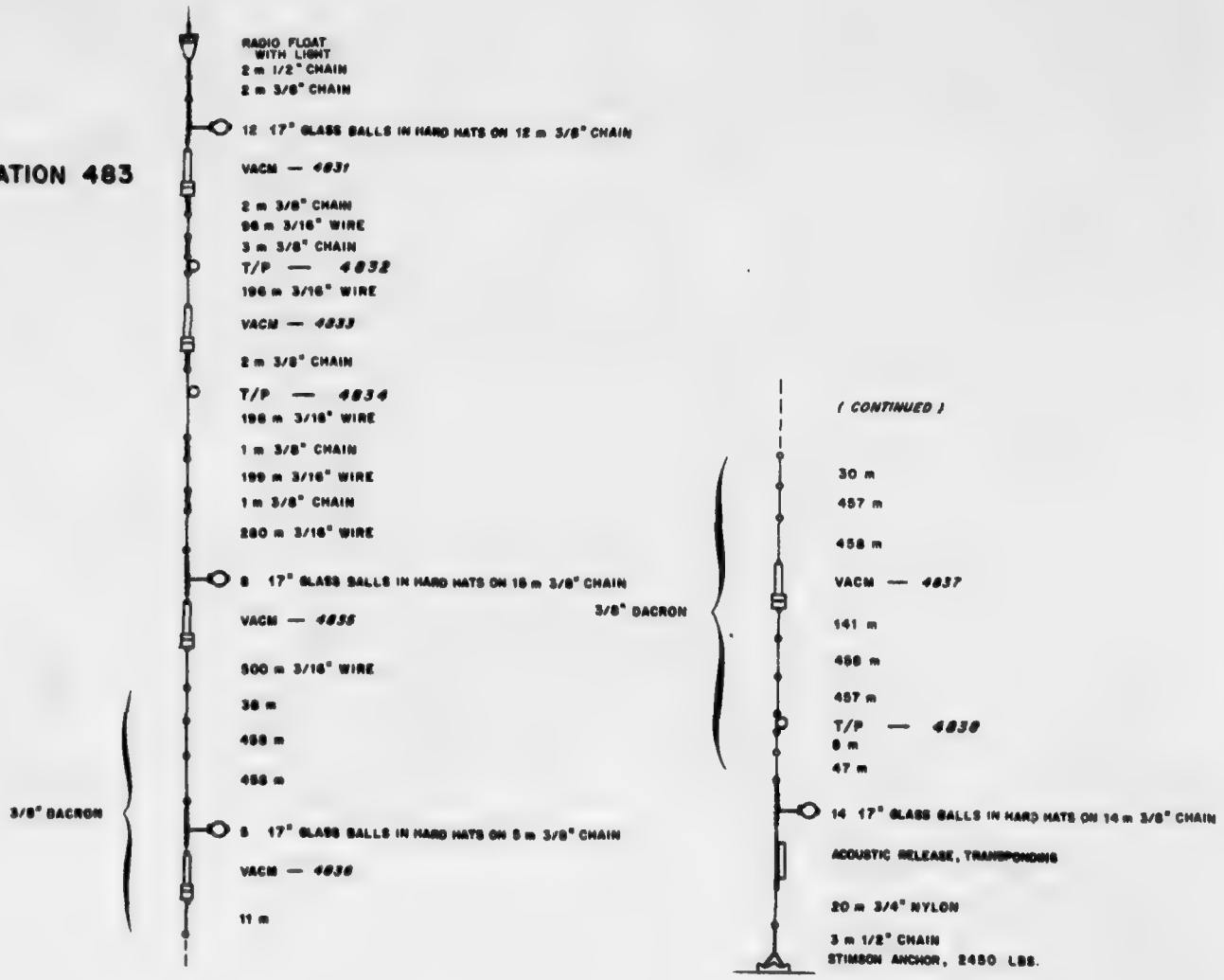
Purpose of Mooring: Mooring #15 of MODE 1 array

Mooring Type: Subsurface mooring

Key	Data Number	Instrument Number	Type	Depth Meters	Comments
+	4831	V-0113	VACM	447	
#	4832	#43	T/P	550	M.I.T.
*	4833	V-0171	VACM	748	U.R.I.
#	4834	#44	T/P	750	M.I.T.
+	4835	V-0117	VACM	1450	
+	4836	V-0107	VACM	2998	
*	4837	V-0177	VACM	3968	
#	4838	#11	T/P	5087	M.I.T.
	Water depth			5192	

COMMENTS ON MOORING:

STATION 483


RADIO FLOAT WITH LIGHT
2 m 1/2" CHAIN
2 m 3/8" CHAIN
12 17" GLASS BALLS IN HARD HATS ON 12 m 3/8" CHAIN
VACM — 4831
2 m 3/8" CHAIN
96 m 3/16" WIRE
3 m 3/8" CHAIN
T/P — 4832
196 m 3/16" WIRE
VACM — 4833
2 m 3/8" CHAIN
T/P — 4834
196 m 3/16" WIRE
1 m 3/8" CHAIN
199 m 3/16" WIRE
1 m 3/8" CHAIN
280 m 3/16" WIRE
8 17" GLASS BALLS IN HARD HATS ON 16 m 3/8" CHAIN
VACM — 4835
500 m 3/16" WIRE
38 m
458 m
458 m
3/8" DACRON
8 17" GLASS BALLS IN HARD HATS ON 8 m 3/8" CHAIN
VACM — 4836
11 m
(CONTINUED)
30 m
457 m
458 m
VACM — 4837
3/8" DACRON
141 m
458 m
457 m
T/P — 4838
8 m
47 m
14 17" GLASS BALLS IN HARD HATS ON 14 m 3/8" CHAIN
ACOUSTIC RELEASE, TRANSPONDING
20 m 3/4" NYLON
3 m 1/2" CHAIN
STIMSON ANCHOR, 2450 LBS.

DATA NUMBER 4833

Instrument No.: V-0171 Type: Vector Averaging Current Meter

Depth: 748 m Water Depth: 5192 m

Start time: 73-March-12 18.07.30.

Stop time: 73-May-31 23.52.30.

Duration: 60d 5h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

Compass - good

Vane - starts sticking May 31 and continues sticking until recovery.
Daily averages may be O. K.

Rotor - good

Temperature - good

STATS DATA/ 4833E800R

	EAST	NORTH	SPEED	*****	EAST & NORTH	*****
MEAN =	-7.17	26.84	86.86	= COVARIANCE	=	806.14
STD. ERR. =	.80	.75	.47	= STD. ERR. OF COVARIANCE	=	55.13
VARIANCE =	5984.32	4327.48	1883.20	= STD. DEV. OF COVARIANCE	=	4038.28
STD. DEV. =	77.23	65.78	41.03	= CORRELATION COEFFICIENT	=	.158
KURTOSIS =	2.98	3.22	2.81	= VECTOR MEAN	=	27.78
SKEWNESS =	.11	-.38	.37	= VECTOR VARIANCE	=	5145.80
				= STD. DEV.	=	71.73

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 7704 POINTS

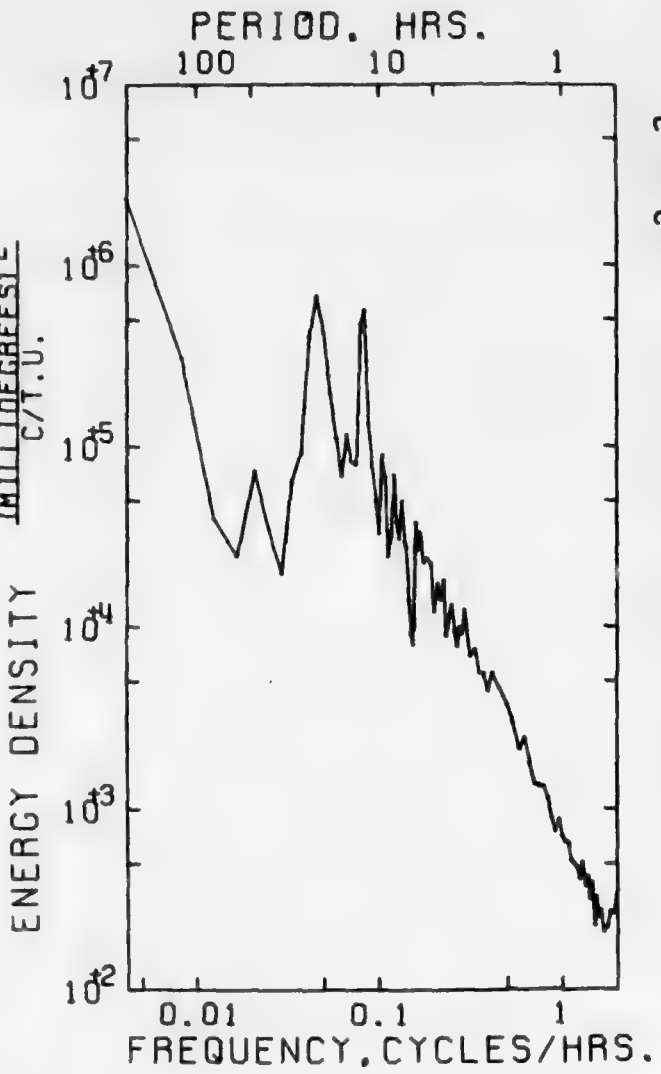
SPANNING RANGE
FROM 73- III-12 18.07.30
TO 73- V -31 23.52.30

DURATION 60 DAYS 5 H 45 M

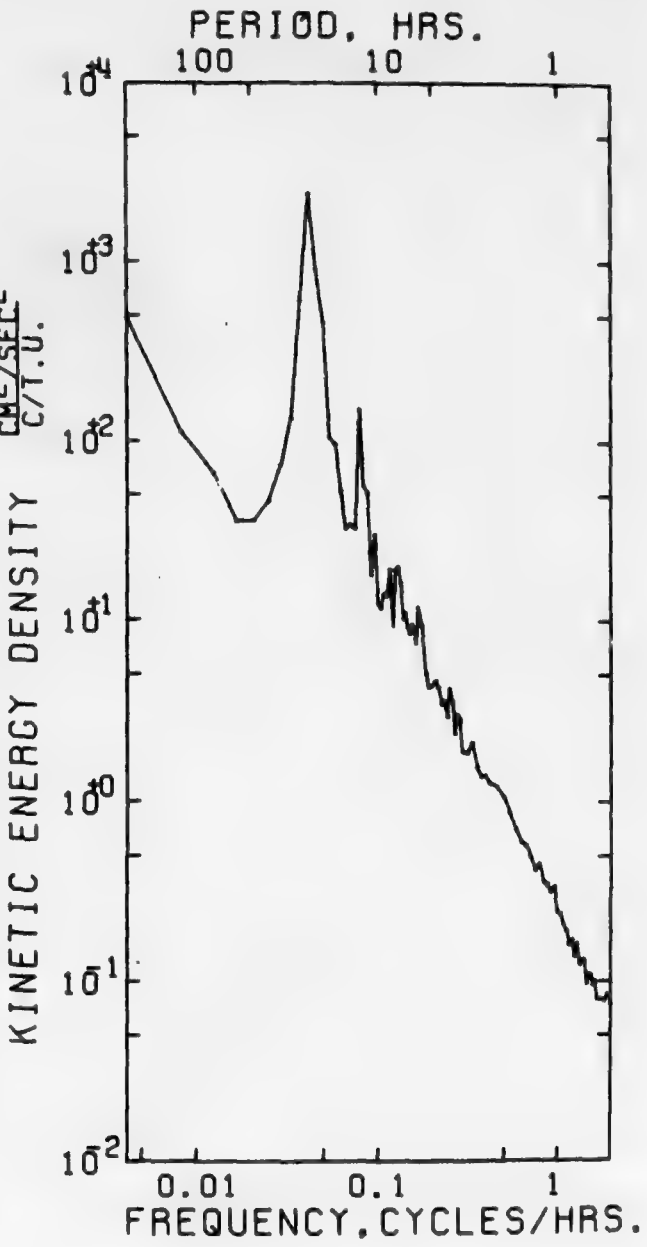
*** TEMPERATURE ***
*** DEGREES C. ***

MEAN =	11.382	STD ERR =	.003
VARIANCE =	.069		
STD. DEV. =	.263		
KURTOSIS =	3.167		
SKEWNESS =	.462		

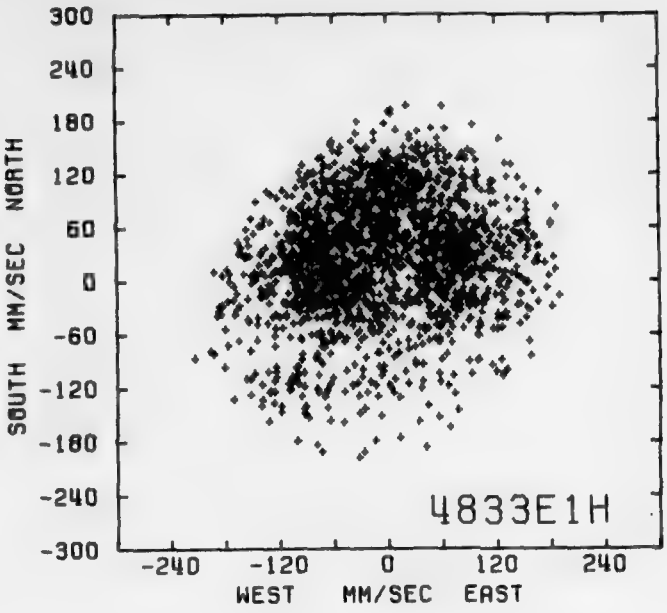
SAMPLE SIZE = 7704 POINTS

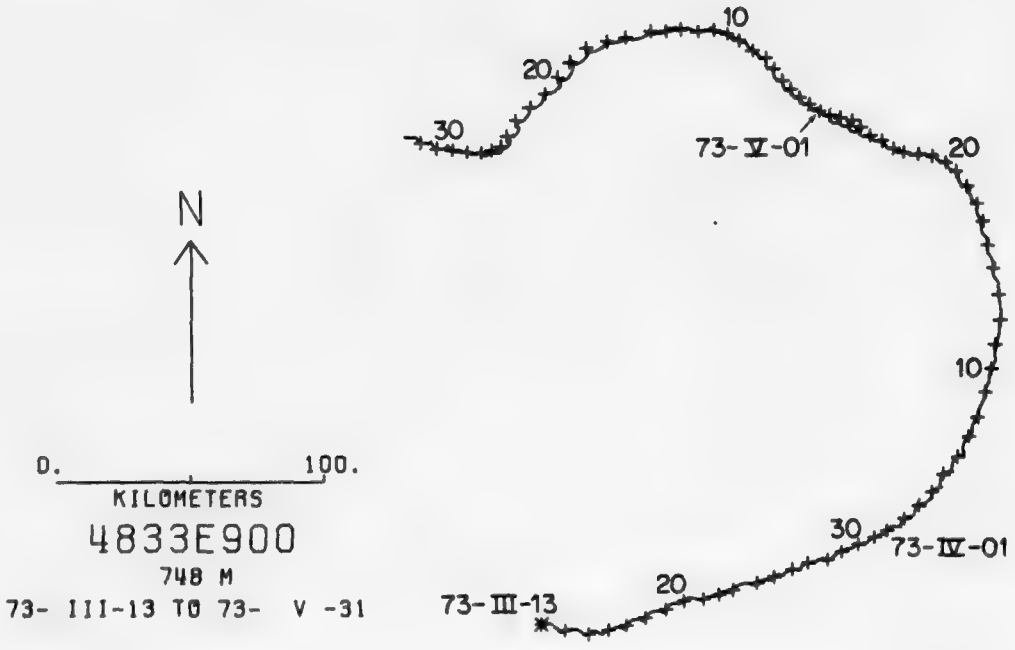


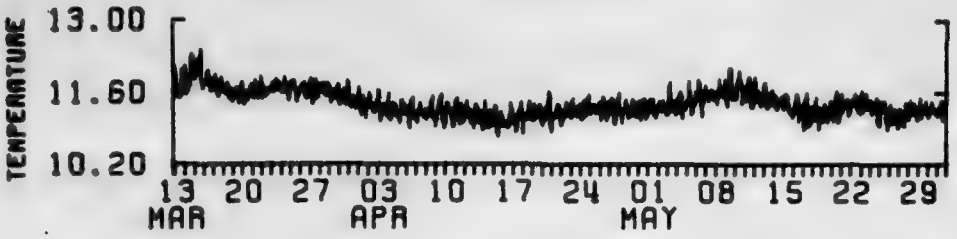
AUTO SPECTRUM
4833E900 TEMPERATURE
748 METERS
73-III-12 TO 73-V-31
1 PIECES WITH 3840 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS

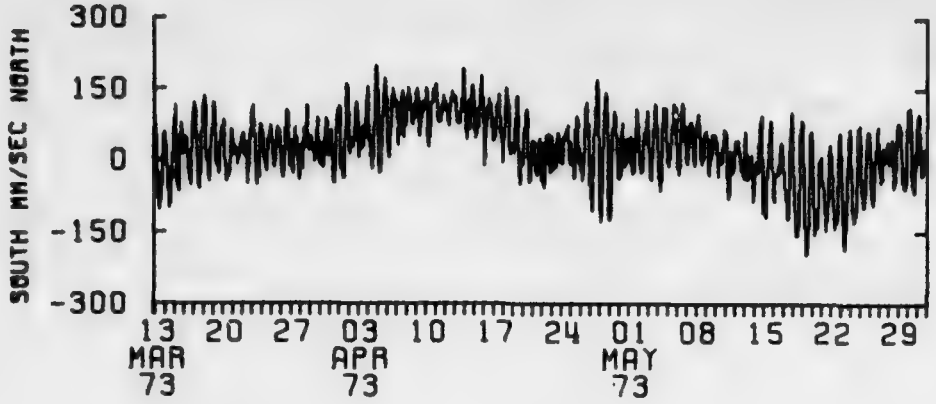


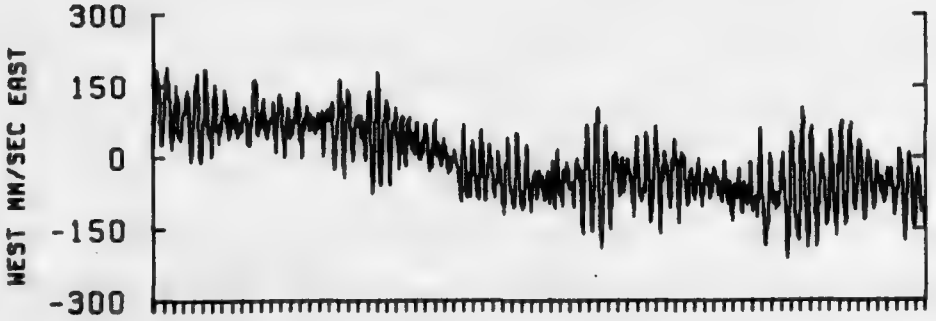
AUTO SPECTRUM
4833E900 EAST
4833E900 NORTH
748 METERS
73-III-12 TO 73-V-31
1 PIECES WITH 3840 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS


300
240
180
120
60
0
-60
-120
-180
-240
-300
SOUTH MM/SEC NORTH
-240
-120
0
120
240
WEST MM/SEC EAST
4833E1H


10
20
30
73-V-01
20
10
30
73-IV-01
20
73-III-13
N
0.
100.
KILOMETERS
4833E900
748 M
73- III-13 TO 73- V -31

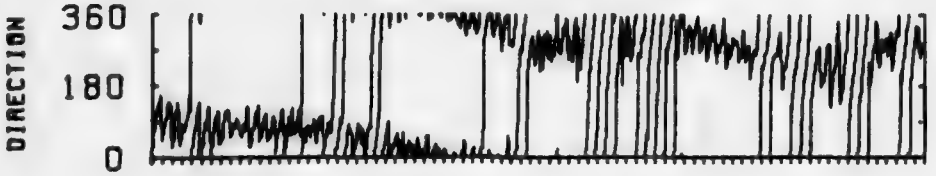


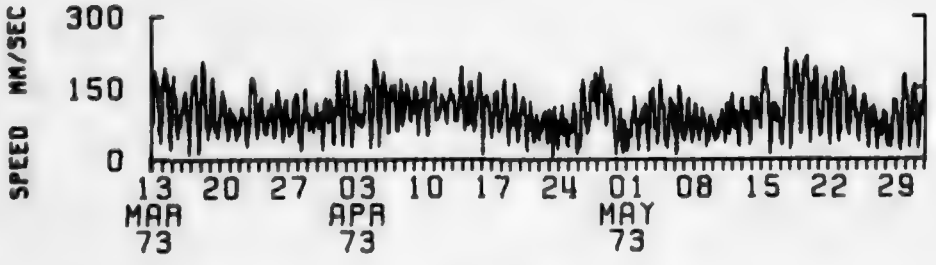




4833E1H

748 M





DATA NUMBER 4837

Instrument No.: V-0177 Type: Vector Averaging Current Meter

Depth: 3968 Water Depth: 5192 m

Start time: 73-March-13 10.07.30.

Stop time: 73-April-19 11,52.30.

Duration: 37d 1h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

Compass - good

Vane - sticky after April 20, stuck after May 19

Rotor - low speeds, may be real

Temperature - good

STATS DATA/ 4837S800A

	EAST	NORTH	SPEED	***** EAST & NORTH *****
MEAN	-32.16	-8.89	43.41	COVARIANCE -46.36
STD. ERR.	.21	.45	.20	STD. ERR. OF COVARIANCE 15.40
VARIANCE	182.34	731.45	141.02	STD. DEV. OF COVARIANCE 818.99
STD. DEV.	12.74	27.05	11.88	CORRELATION COEFFICIENT -.135
KURTOSIS	3.02	2.89	2.73	VECTOR MEAN 33.85
SKEWNESS	.05	.72	.34	VECTOR VARIANCE 448.88
				STD. DEV. 21.14

UNITS OF RAW DATA VARIABLES = *** TEMPERATURE ***
*** DEGREES C. ***

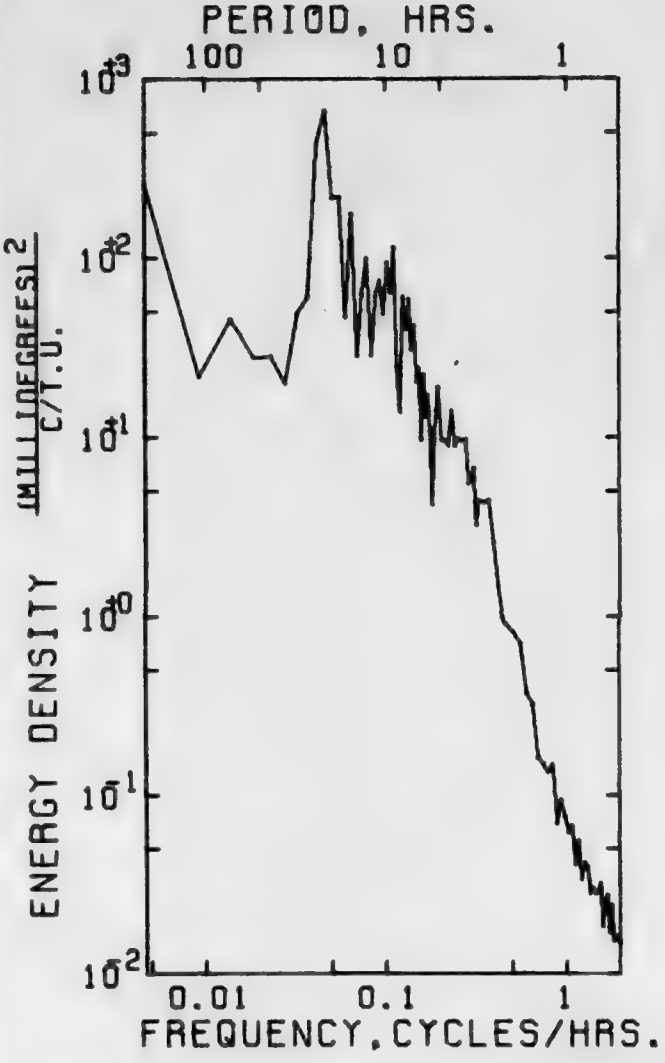
SAMPLE SIZE = 3560 POINTS

SPANNING RANGE
FROM 73- III-13 10.07.30
TO 73- IV -18 11.52.30

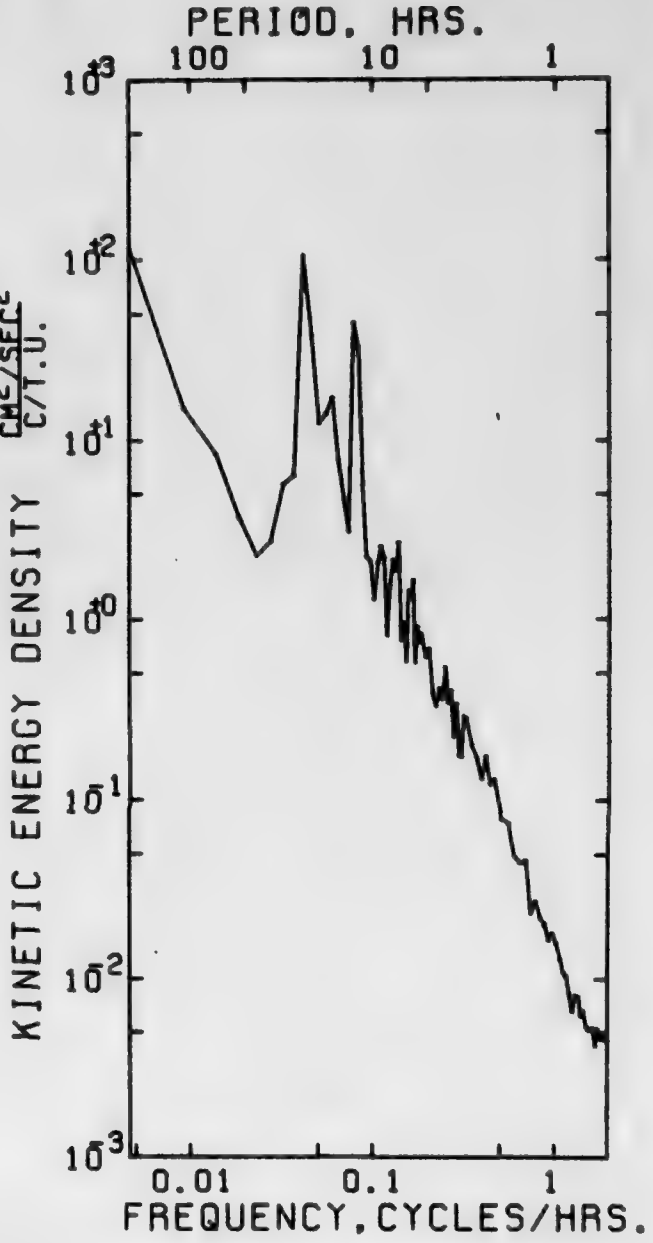
DURATION 37 DAYS 1 H 45 M

MEAN = 2.311 STD ERR = .000
VARIANCE = .000
STD. DEV. = .005
KURTOSIS = 2.834
SKEWNESS = .266

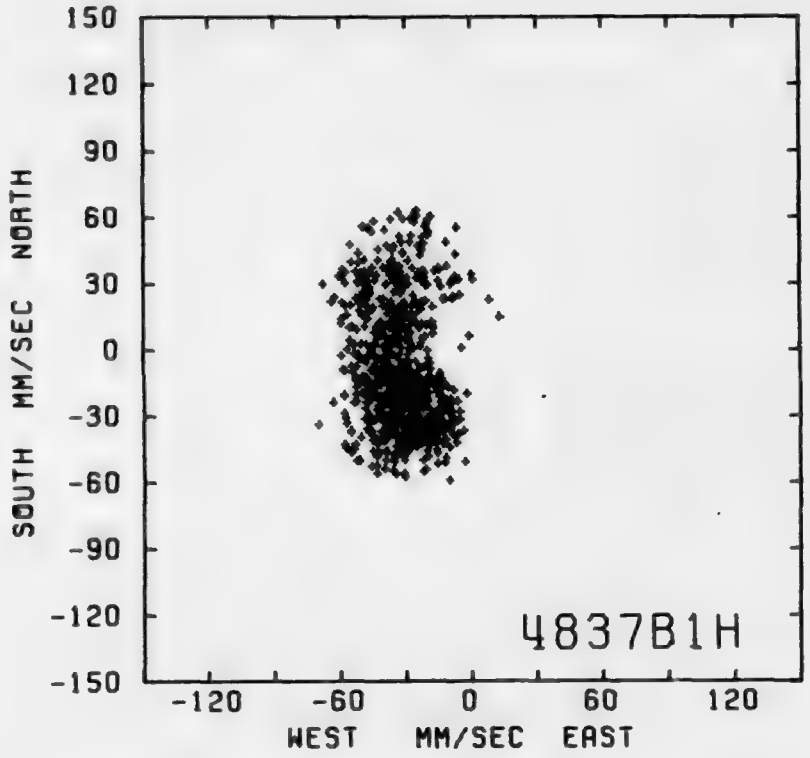
SAMPLE SIZE = 3560 POINTS

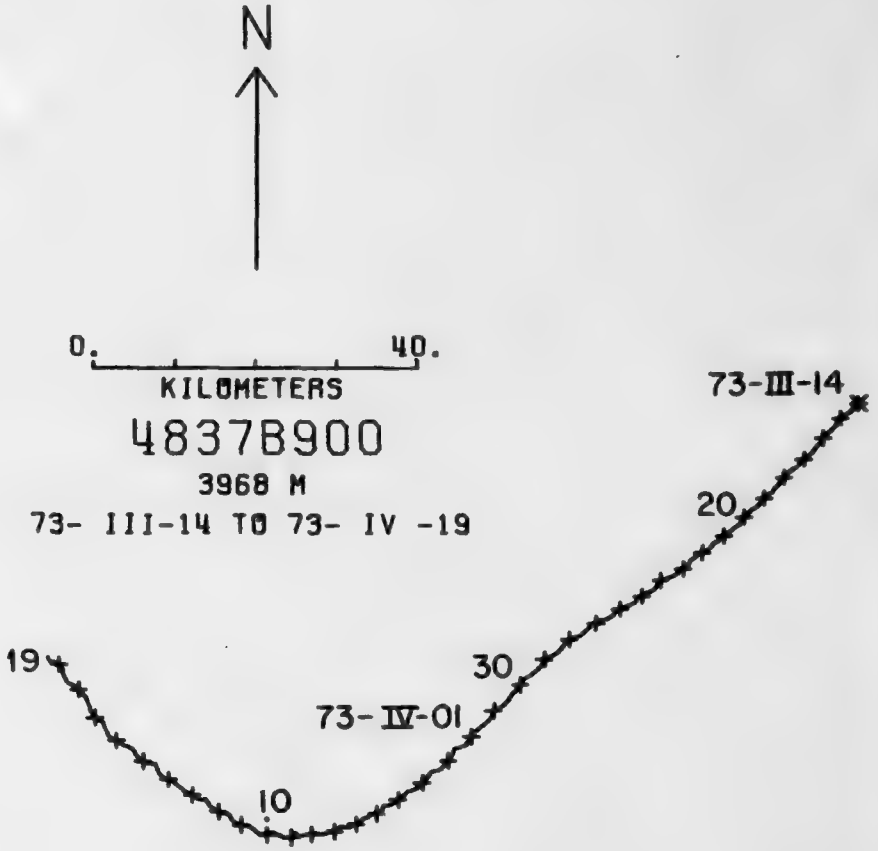


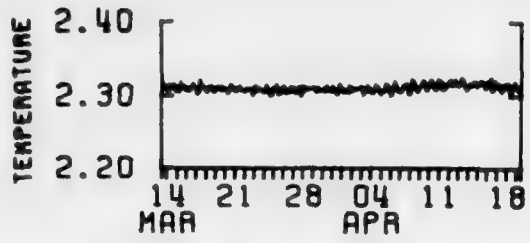
AUTO SPECTRUM
48378900 TEMPERATURE
3968 METERS
73-III-13 TO 73-IV-18
1 PIECES WITH 1728 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS

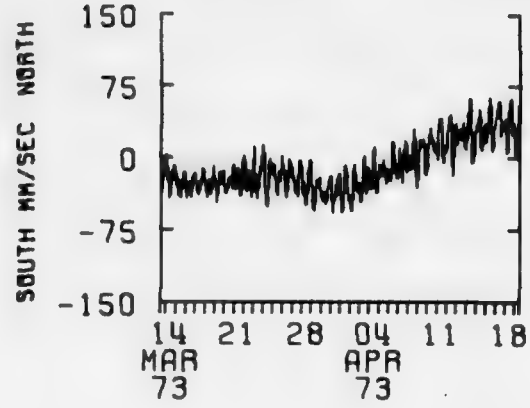


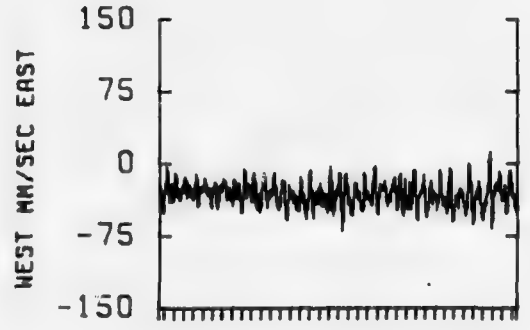
AUTO SPECTRUM
48378900 EAST
48378900 NORTH
3968 METERS
73-III-13 TO 73-IV-18
1 PIECES WITH 1728 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS


150
120
90
60
30
0
-30
-60
-90
-120
-150
SOUTH MM/SEC NORTH
-120
-60
0
60
120
WEST MM/SEC EAST
4837B1H


N
0.
40.
KILOMETERS
4837B900
3968 M
73- III-14 TO 73- IV -19
73-III-14
20
30
73-IV-01
19
10

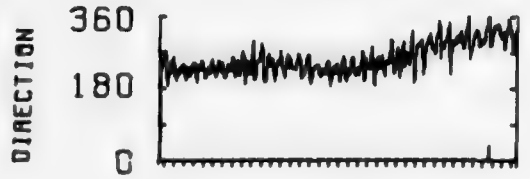


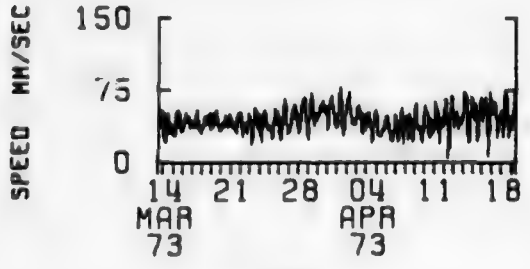




4837B1H

3968 M





Mooring No. 484

Set 1973 Mar 13 — 27° 25.1'N — 67° 59.5'W
Year Month Day — Latitude — Longitude

Set by J. Gifford - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 1

Retrieved 1973 July 3
Year Month Day

Retrieved by G. Tupper - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 6

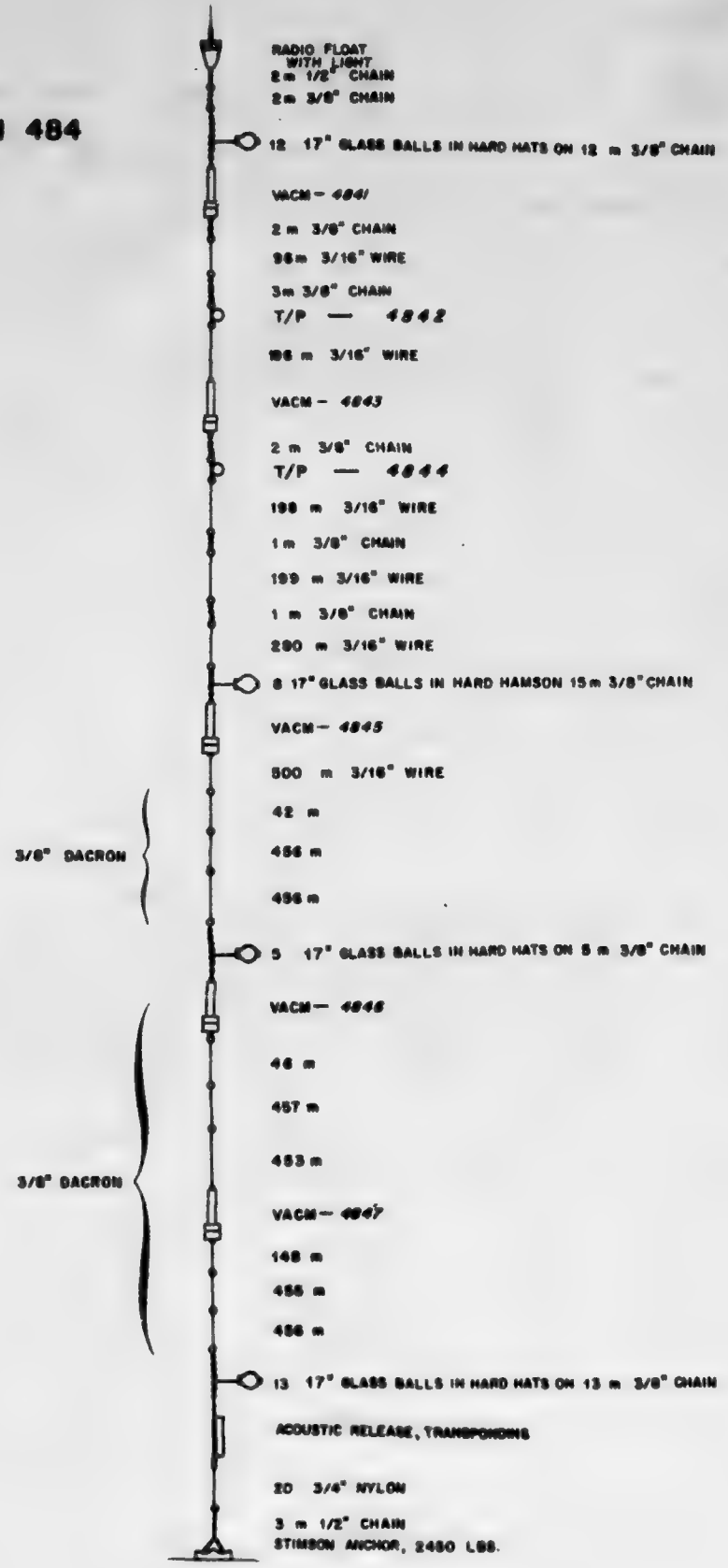
Purpose of Mooring: Mooring #16 of MODE 1 array

Mooring Type: Subsurface mooring

Key	Data Number	Instrument Number	Type	Depth Meters	Comments
*	4841	V-0108	VACM	441	
#	4842	#50	T/P	543	M.I.T.
*	4843	V-0175	VACM	741	U.R.I.
#	4844	#45	T/P	744	M.I.T.
	4845	V-0114	VACM	1443	No recoverable data
+	4846	V-0181	VACM	2953	
*	4847	V-0185	VACM	3923	
	Water depth			5151	

COMMENTS ON MOORING:

STATION 484


RADIO FLOAT
WITH LIGHT
2 m 1/2" CHAIN
2 m 3/8" CHAIN
12 17" GLASS BALLS IN HARD HATS ON 12 m 3/8" CHAIN
VACM – 4841
2 m 3/8" CHAIN
98 m 3/16" WIRE
3m 3/8" CHAIN
T/P — 4842
196 m 3/16" WIRE
VACM – 4843
2 m 3/8" CHAIN
T/P — 4844
198 m 3/16" WIRE
1 m 3/8" CHAIN
199 m 3/16" WIRE
1 m 3/8" CHAIN
290 m 3/16" WIRE
8 17" GLASS BALLS IN HARD HAMSON 15 m 3/8" CHAIN
VACM – 4845
500 m 3/16" WIRE
3/8" DACRON
42 m
456 m
456 m
5 17" GLASS BALLS IN HARD HATS ON 5 m 3/8" CHAIN
VACM – 4846
3/8" DACRON
46 m
457 m
453 m
VACM – 4847
148 m
455 m
456 m
13 17" GLASS BALLS IN HARD HATS ON 13 m 3/8" CHAIN
ACOUSTIC RELEASE, TRANSPONDING
20 3/4" NYLON
3 m 1/2" CHAIN
STIMSON ANCHOR, 2450 LBS.

DATA NUMBER 4841

Instrument No.: V-0108 Type: Vector Averaging Current Meter

Depth: 441 m Water Depth: 5151 m

Start time: 73-March-13 12.07.30.

Stop time: 73-April-01 23.52.30.

Duration: 19d 11h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

Compass - good

Vane - good

Rotor - periodically below threshold

Temperature - good

STATS DATA/ 4841B900A

	EAST	NORTH	SPEED
MEAN	-86.60	-28.84	107.24
STD. ERR.	.83	.80	.80
VARIANCE	1288.48	1485.37	1486.70
STD. DEV.	36.05	38.54	38.58
KURTOSIS	3.01	2.48	2.85
SKEWNESS	-.20	-.05	.17

***** EAST & NORTH *****	
COVARIANCE	505.14
STD. ERR. OF COVARIANCE	103.57
STD. DEV. OF COVARIANCE	4480.87
CORRELATION COEFFICIENT	.384
VECTOR MEAN	101.01
VECTOR VARIANCE	1382.43
STD. DEV.	37.32

UNITS OF RAW DATA VARIABLES = *** TEMPERATURE ***
*** DEGREES C. ***

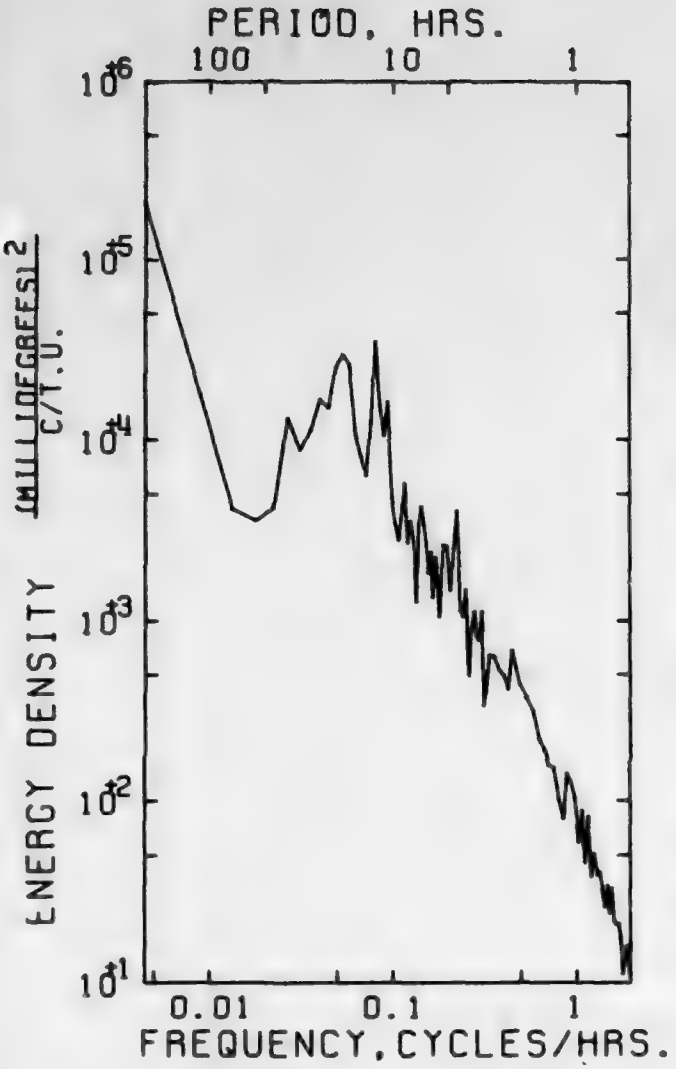
SAMPLE SIZE = 1872 POINTS

SPANNING RANGE
FROM 73- III-13 12.07.30
TO 73- IV -01 23.52.30

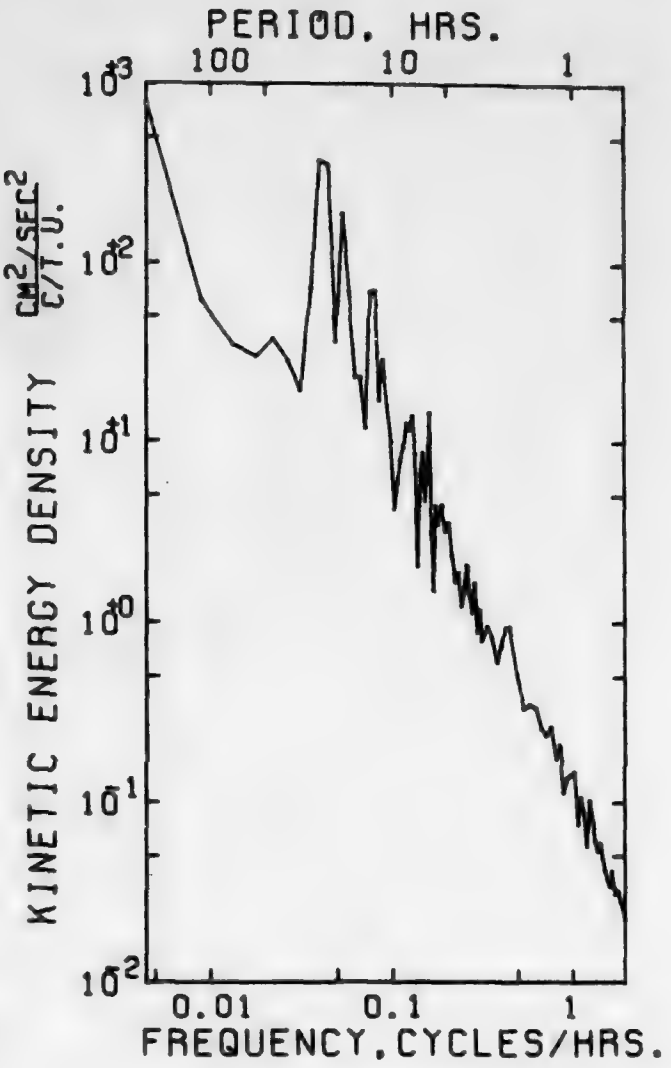
DURATION 18 DAYS 11 H 45 M

MEAN	16.852	STD ERR	.001
VARIANCE	.003		
STD. DEV.	.058		
KURTOSIS	2.951		
SKEWNESS	-.26*		

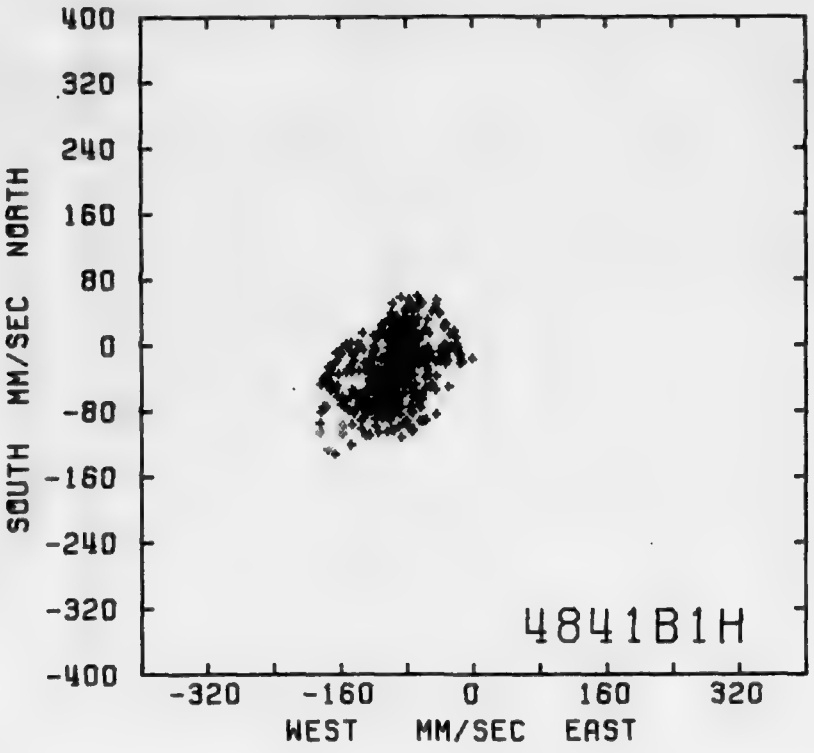
SAMPLE SIZE = 1872 POINTS



AUTO SPECTRUM
48418900 TEMPERATURE
441 METERS
73-III-13 TO 73-IV-01
1 PIECES WITH 900 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS



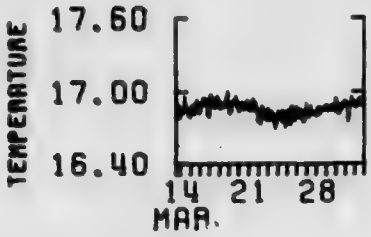
AUTO SPECTRUM
48418900 EAST
48418900 NORTH
441 METERS
73-III-13 TO 73-IV-01
1 PIECES WITH 900 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS

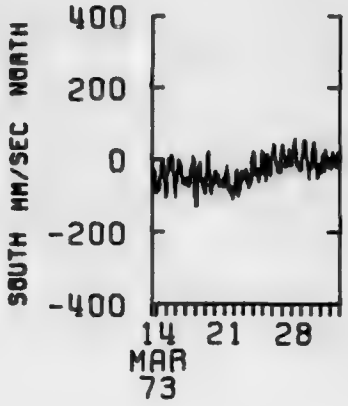


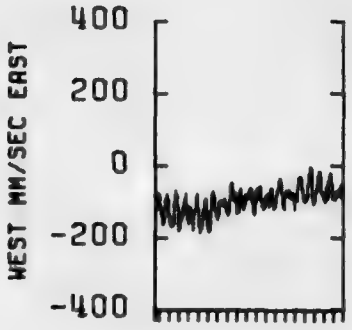
4841B900

441 M

73- III-14 TO 73- IV -01

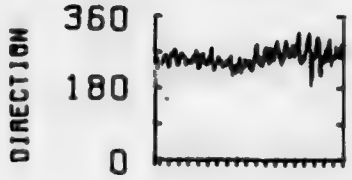


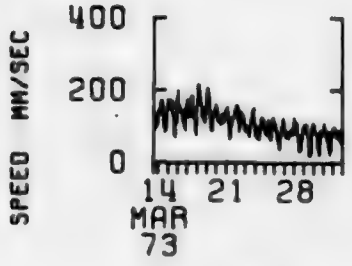




4841B1H

441 M





DATA NUMBER 4843

Instrument No.: V-0175 Type: Vector Averaging Current Meter

Depth: 741 m Water Depth: 5151 m

Start time: 73-March-13 16.07.40.

Stop time: 73-May-09 17.52.40.

Duration: 57d 1h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:
Instrument owned by the University of Rhode Island

Compass - good

Vane - stuck or sticking from May 27 to end

Rotor - Compass and vane data were not stored on tape unless there was a rotor count during the recording interval. Temperature values were stored on tape regardless of rotor value. Rotor starts showing threshold values (0 rotor count) from May 9 to end.

Temperature - good

STATS DATA/ 4843E800A

	EAST	NORTH	SPEED	***** EAST & NORTH	*****
MEAN =	-48.40	-16.33	80.10	COVARIANCE =	48.36
STD. ERR. =	.68	.67	.48	STD. ERR. OF COVARIANCE =	48.76
VARIANCE =	2557.58	2456.64	1305.07	STD. DEV. OF COVARIANCE =	3809.44
STD. DEV. =	50.57	48.56	36.13	CORRELATION COEFFICIENT =	.018
KURTOSIS =	2.85	2.68	2.82	VECTOR MEAN =	52.05
SKEWNESS =	.19	.11	.58	VECTOR VARIANCE =	2507.11
				STD. DEV. =	50.07

UNITS OF RAW DATA VARIABLES = *** TEMPERATURE ***
*** DEGREES C. ***

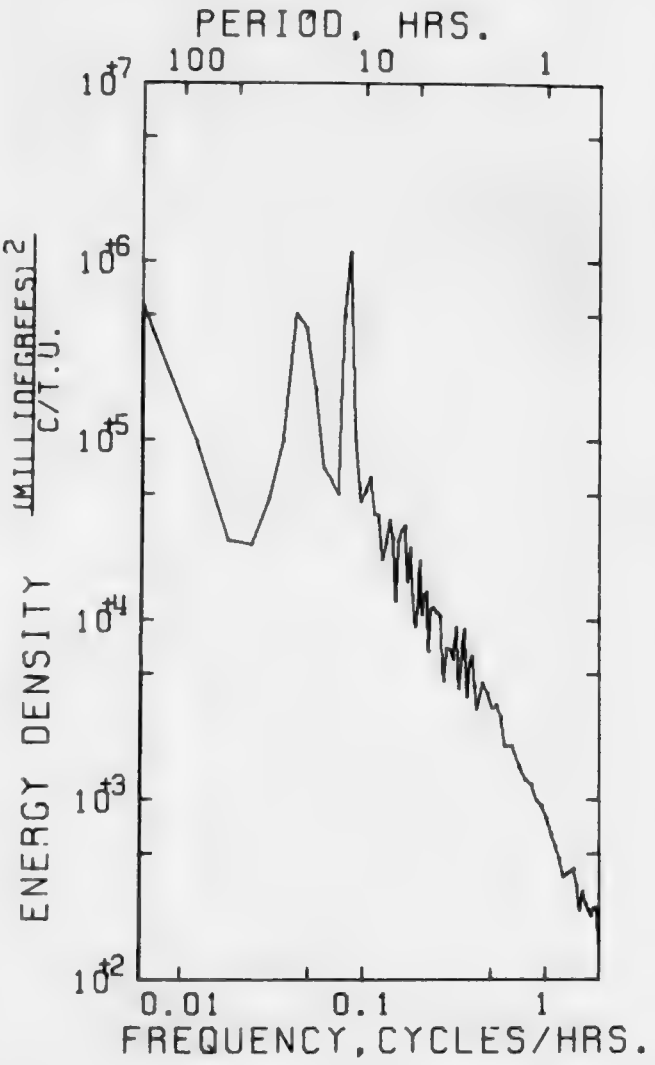
SAMPLE SIZE = 5480 POINTS

SPANNING RANGE
FROM 73- III-13 16.07.40
TO 73- V -09 17.52.40

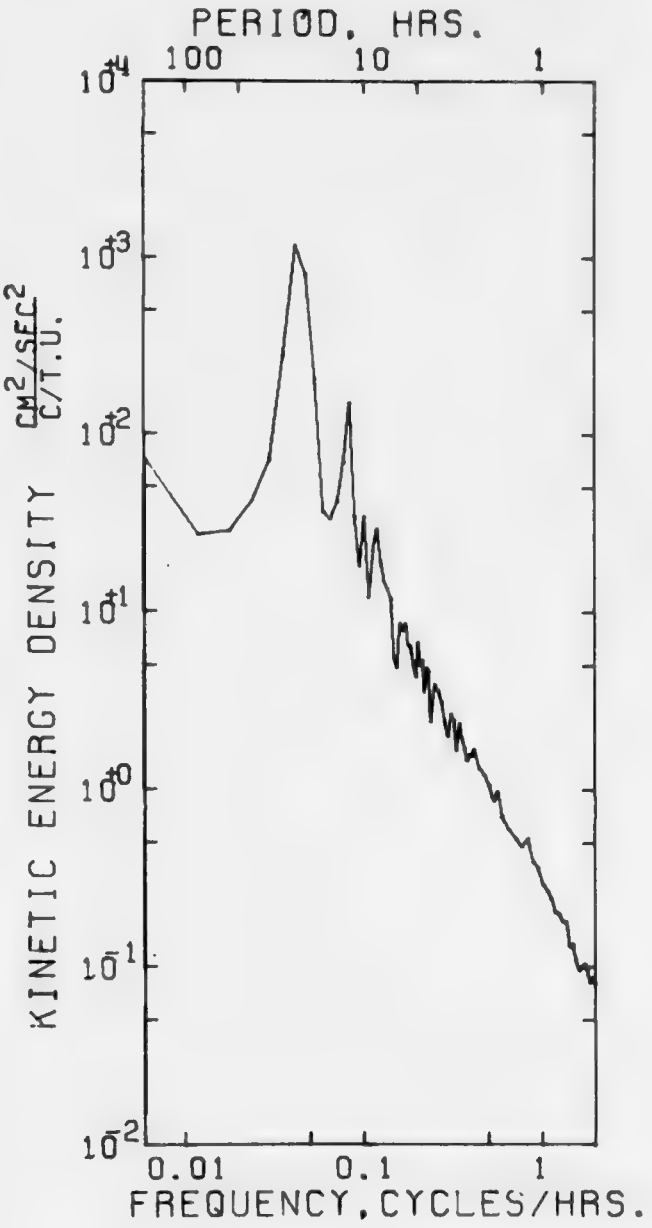
DURATION 57 DAYS 1 H 45 M

MEAN = 11.903 STD ERR = .004
VARIANCE = .175
STD. DEV. = .374
KURTOSIS = 2.259
SKEWNESS = -.16

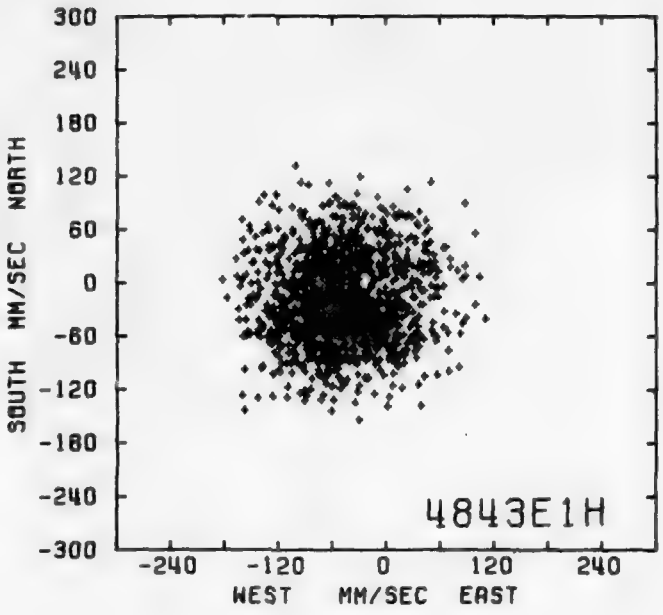
SAMPLE SIZE = 5480 POINTS

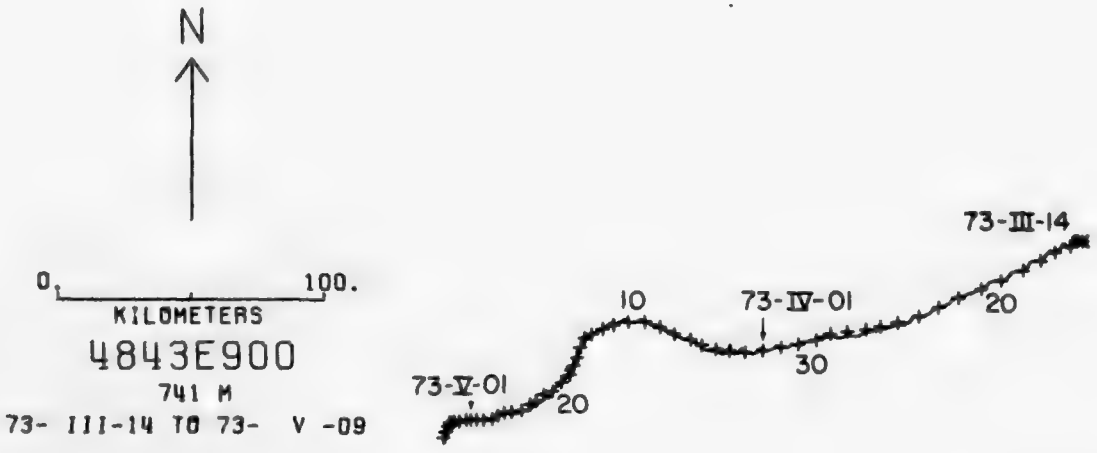


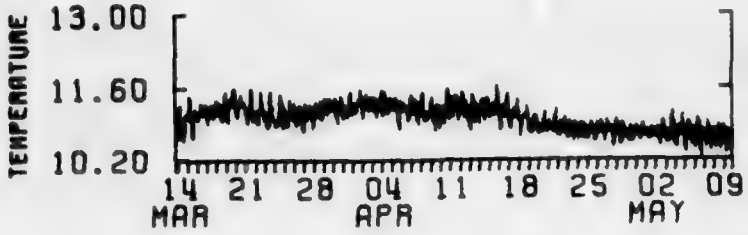
AUTO SPECTRUM
4843E900 TEMPERATURE
741 METERS
73-III-13 TO 73-V-08
1 PIECES WITH 2700 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS

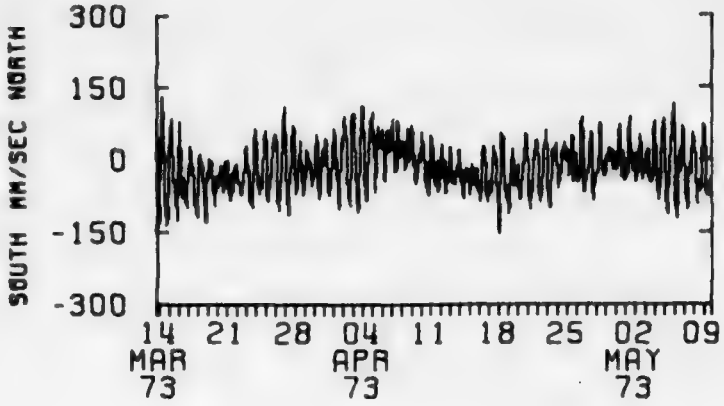


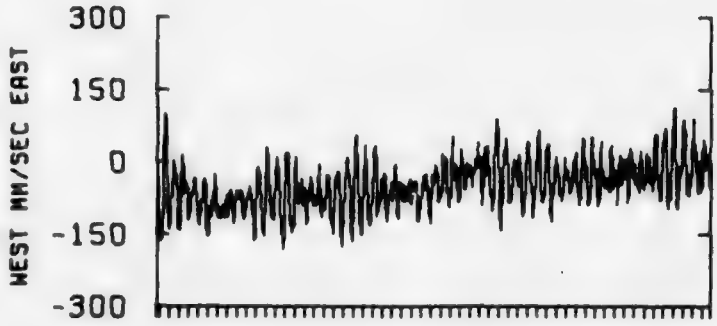
AUTO SPECTRUM
4843E900 EAST
4843E900 NORTH
741 METERS
73-III-13 TO 73-V-08
1 PIECES WITH 2700 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS


300
240
180
120
60
0
-60
-120
-180
-240
-300
SOUTH MM/SEC NORTH
4843E1H
-240
-120
0
120
240
WEST
MM/SEC
EAST


N
0.
100.
KILOMETERS
4843E900
741 M
73- III-14 TO 73- V -09
73-III-14
10
73-IV-01
20
30
73-V-01
20

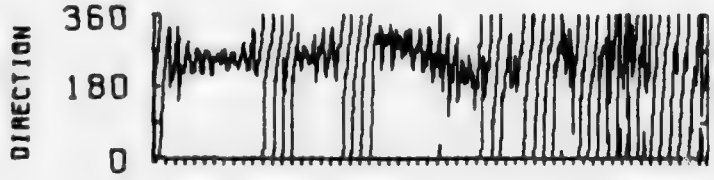


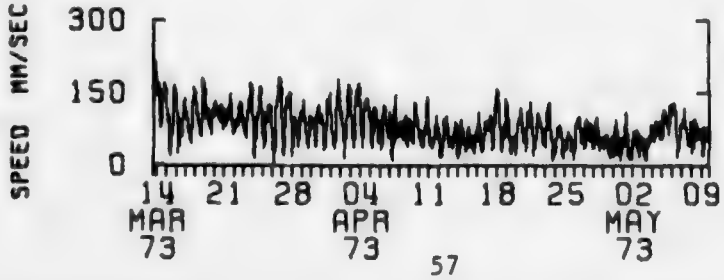




4843E1H

741 M





DATA NUMBER 4847

Instrument No.: V-0185 Type: Vector Averaging Current Meter

Depth: 3973 m Water Depth: 5151 m

Start time: 73-March-13 23.07.30.

Stop time: 73-April-10 03.52.30.

Duration: 27d 4h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:
Compass - good

Vane - stuck from April 10 to recovery

Rotor - very low speeds, may be real

STATS DATA/ 4847S800R

	EAST	NORTH	SPEED	***** EAST & NORTH	*****
MEAN =	-.32	8.04	20.78	COVARIANCE =	95.81
STD. ERR. =	.39	.48	.22	STD. ERR. OF COVARIANCE =	7.68
VARIANCE =	392.70	550.44	122.02	STD. DEV. OF COVARIANCE =	392.41
STD. DEV. =	19.82	23.46	11.05	CORRELATION COEFFICIENT =	.206
KURTOSIS =	2.76	2.94	3.81	VECTOR MEAN =	8.05
SKEWNESS =	-.09	-.00	1.18	VECTOR VARIANCE =	471.57
				STD. DEV. =	21.72

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 2612 POINTS

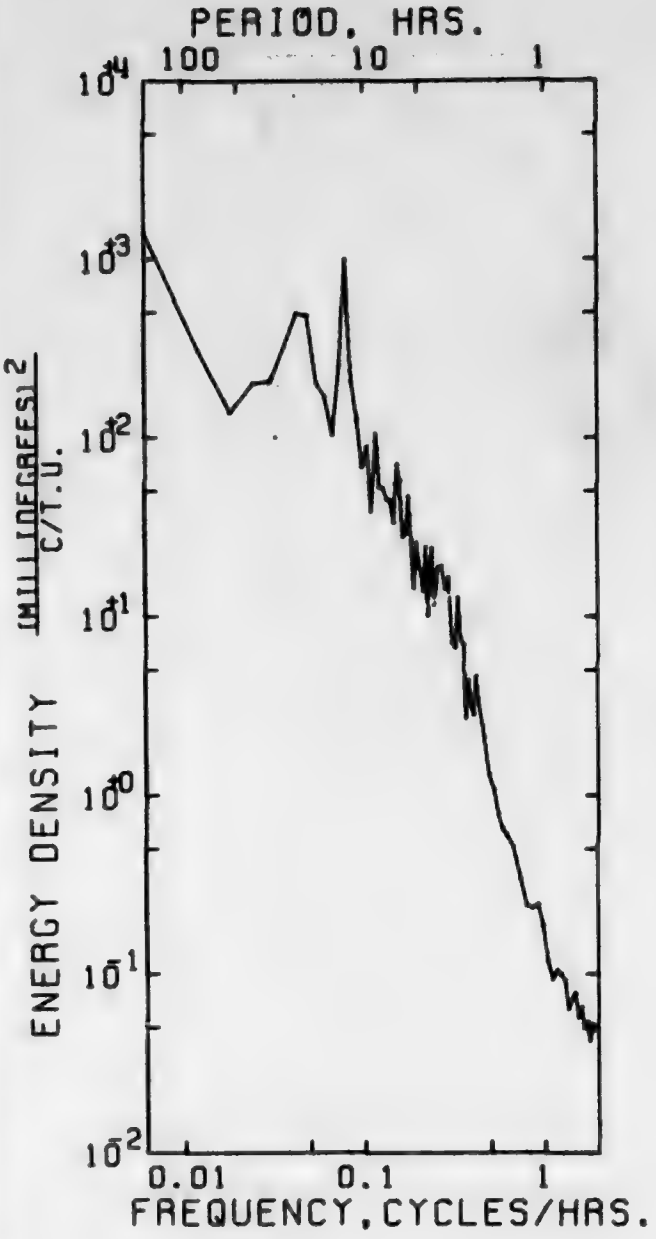
SPANNING RANGE
FROM 73- III-13 23.07.30
TO 73- IV -10 03.52.30

DURATION 27 DAYS 4 H 45 M

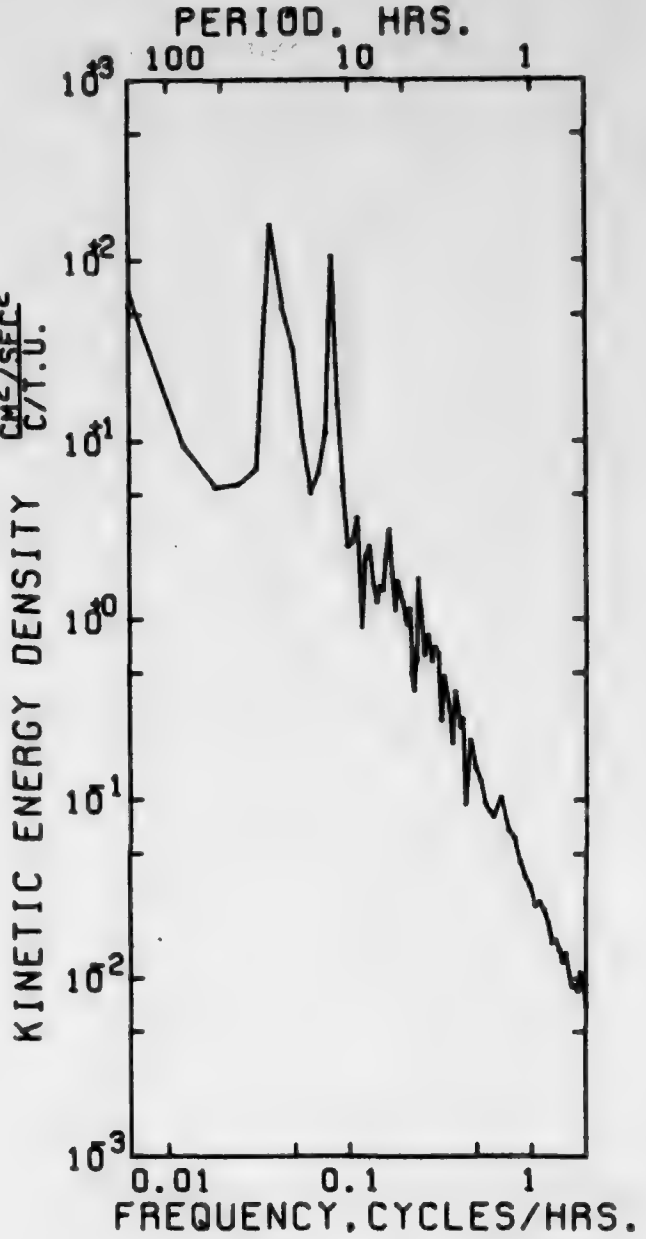
*** TEMPERATURE ***
*** DEGREES C. ***

MEAN =	2.343	STD ERR =	.000
VARIANCE =	.000		
STD. DEV. =	.009		
KURTOSIS =	2.461		
SKEWNESS =	.155		

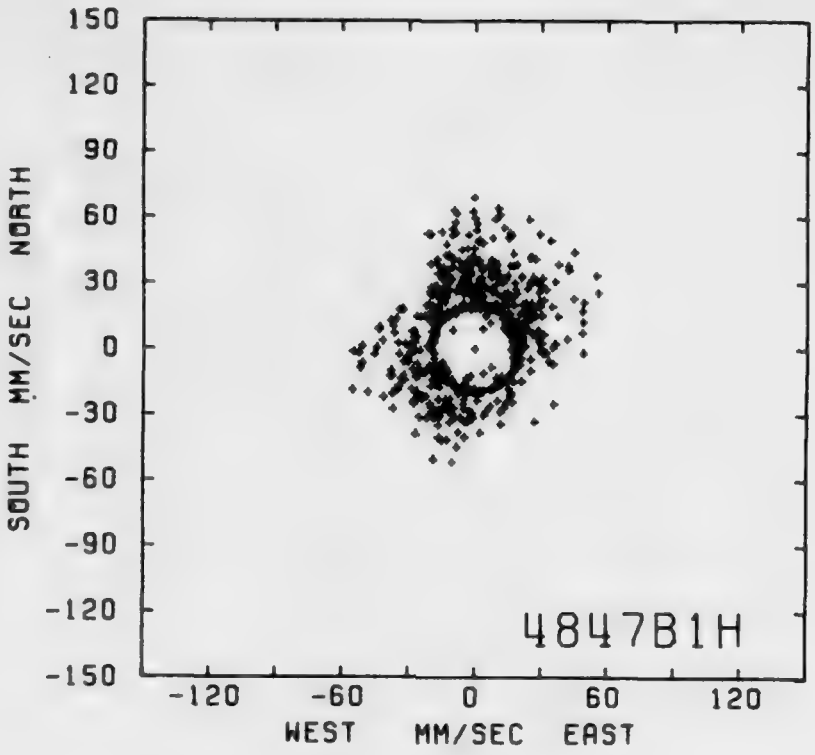
SAMPLE SIZE = 2612 POINTS



AUTO SPECTRUM
48478900 TEMPERATURE
3973 METERS
73-III-13 TO 73-IV-09
1 PIECES WITH 1296 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS



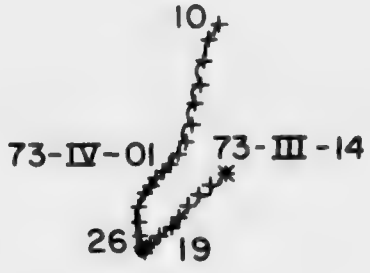
AUTO SPECTRUM
48478900 EAST
48478900 NORTH
3973 METERS
73-III-13 TO 73-IV-09
1 PIECES WITH 1296 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS

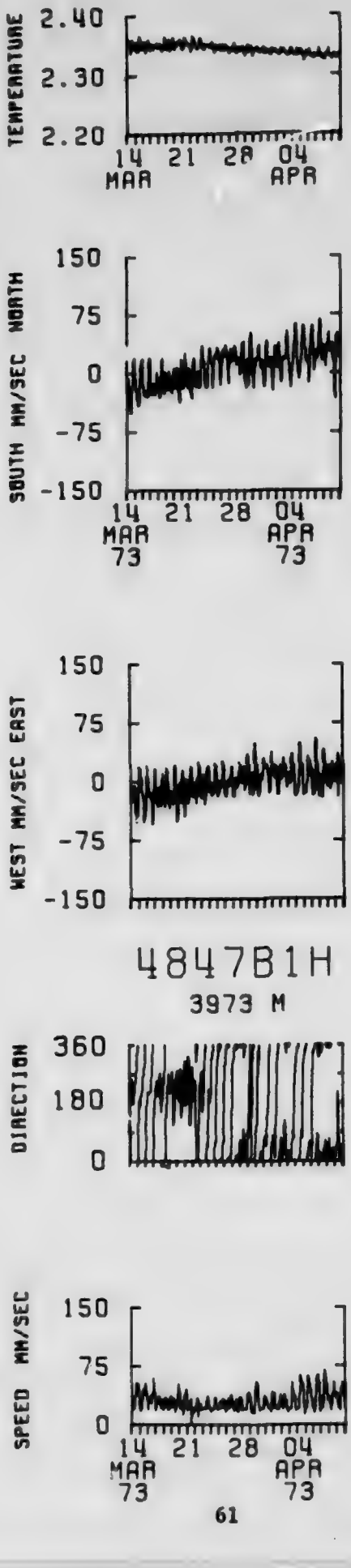


4847B900

3973 M

73- III-14 TO 73- IV -10




TEMPERATURE
2.40
2.30
2.20
14
MAR
21
28
04
APR
SOUTH MM/SEC NORTH
150
75
0
-75
-150
14
MAR
73
21
28
04
APR
73
WEST MM/SEC EAST
150
75
0
-75
-150
4847B1H
3973 M
DIRECTION
360
180
0
SPEED MM/SEC
150
75
0
14
MAR
73
21
28
04
APR
73

Mooring No. 485

Set 1973 Mar 13 (Year Month Day) — 26° 23.8'N (Latitude) — 69° 21.0'W (Longitude)

Set by G. Tupper - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 1

Retrieved 1973 July 2 (Year Month Day)

Retrieved by J. Gifford - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 6

Purpose of Mooring: Mooring #11 of MODE 1 array

Mooring Type: Subsurface mooring

Key	Data Number	Instrument Number	Type	Depth Meters	Comments
*	4851	V-078	VACM	421	
#	4852	#39	T/P	520	M.I.T.
*	4853	V-0155	VACM	723	I.O.S.
	4854	#57	T/P	928	M.I.T., flooded
#	4855	#60	T/P	1133	M.I.T.
*	4856	V-0139	VACM	1426	
#	4857	#20	T/P	1926	M.I.T.
#	4858	#19	T/P	2442	M.I.T.
	4859	V-0136	VACM	2943	Installation error, no data
+	485,10	#27	T/P	3981	M.I.T.
#	485,11	#32	T/P	4387	M.I.T.
+	485,12	#10	T/P	5305	M.I.T.
	485,13	H-871	Film	5309	Nova University
	Water depth			5420	

COMMENTS ON MOORING:

STATION 485

RADIO FLOAT
WITH LIGHT
2 m 1/2" CHAIN
2 m 3/8" CHAIN
13 17" GLASS BALLS IN HARD HATS ON 13m 3/8" CHAIN
VACM — 4851
2 m 3/8" CHAIN
96 m 3/16" WIRE
3 m 3/8" CHAIN
T/P — 4852
196 m 3/16" WIRE
VACM — 4853
2 m 3/8" CHAIN
198 m
T/P — 4854
199 m
T/P — 4855
280 m
3/16" WIRE
8 17" GLASS BALLS IN HARD HATS ON 15 m 3/8" CHAIN
VACM — 4856
500 m
T/P — 4857
10 m
16 m
457 m
3/8" DACRON
T/P — 4858
8 m
456 m
(CONTINUED)
(CONTINUED)
8 17" GLASS BALLS IN HARD HATS ON 8m 3/8" CHAIN
VACM — 4859
25 m
12 m
464 m
459 m
3/8" DACRON
T/P — 485,10
374 m
T/P — 485,11
37 m
413 m
429 m
T/P — 485,12
2 m 1/2" DACRON
CURRENT METER — 485,13
19 m 3/8" DACRON
36 m 3/8" DACRON
14 17" GLASS BALLS IN HARD HATS ON 14 m 3/8" CHAIN
ACOUSTIC RELEASE, TRANSPONDING
20 m 3/4" NYLON
3 m 1/2" CHAIN
STIMSON ANCHOR, 2450 LBS.

DATA NUMBER 4851

Instrument No.: V-0178

Type: Vector Averaging Current Meter

Depth: 421 m

Water Depth: 5420 m

Start time: 73-March-14 04.07.30.

Stop time: 73-March-30 18.52.30.

Duration: 16d 14h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

Compass - good

Vane - becomes stuck March 30 to recovery

Rotor - at threshold between April 1 and May 30

Temperature - good

STATS DATA/ 48518800A

	EAST	NORTH	SPEED	***** EAST & NORTH *****	
MEAN =	83.18	-2.67	85.33	COVARIANCE =	-10.58
STD. ERR. =	.86	1.14	.82	STD. ERR. OF COVARIANCE =	88.47
VARIANCE =	1173.20	2082.02	1075.58	STD. DEV. OF COVARIANCE =	3933.75
STD. DEV. =	34.25	45.41	32.80	CORRELATION COEFFICIENT =	-.007
KURTOSIS =	2.59	2.74	2.37	VECTOR MEAN =	83.23
SKEWNESS =	.20	.82	.08	VECTOR VARIANCE =	1817.81
				STD. DEV. =	40.22

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 1596 POINTS

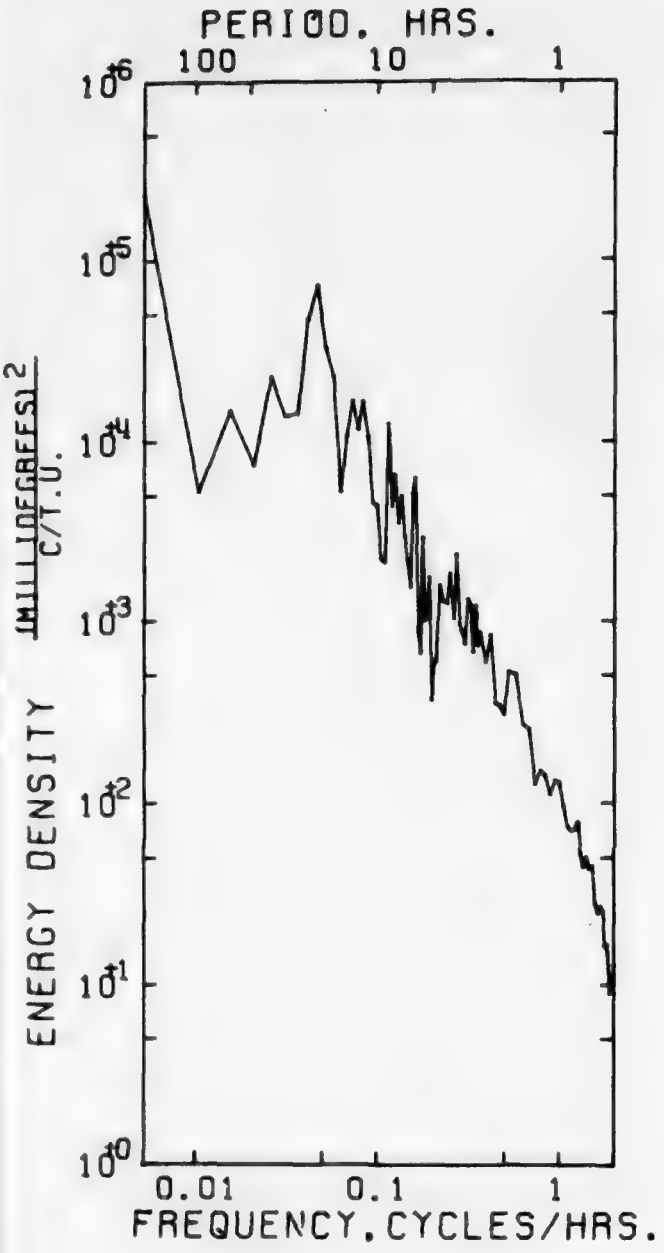
SPANNING RANGE
FROM 73- III-14 04.07.30
TO 73- III-30 18.52.30

DURATION 16 DAYS 14 H 45 M

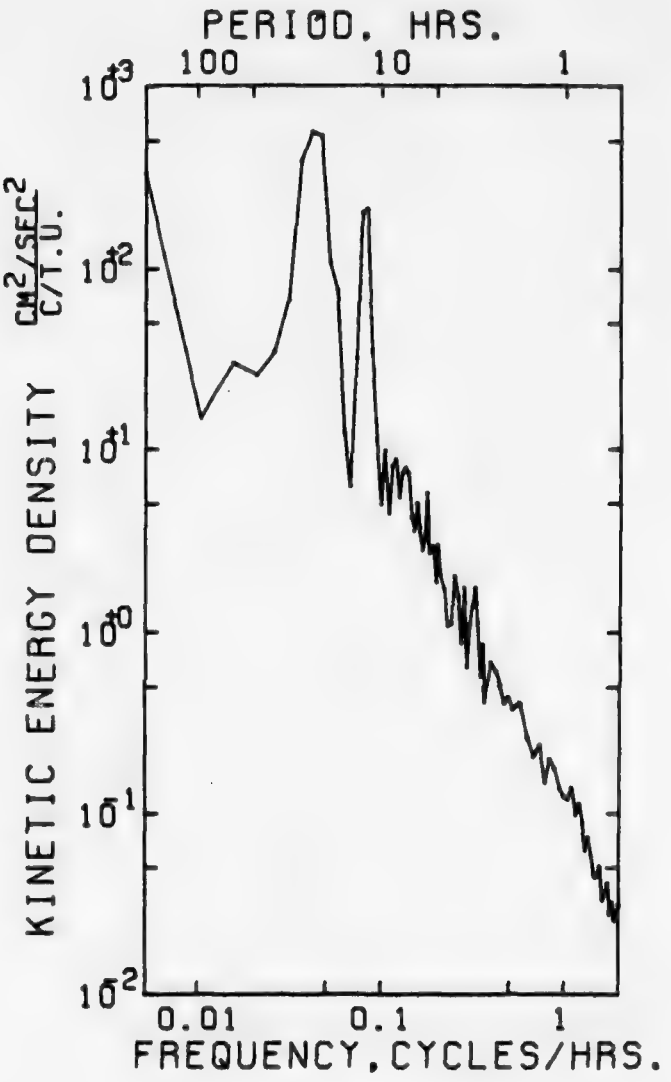
*** TEMPERATURE ***
*** DEGREES C. ***

MEAN = 16.967 STD ERR = .002
VARIANCE = .005
STD. DEV. = .069
KURTOSIS = 2.547
SKEWNESS = -.292

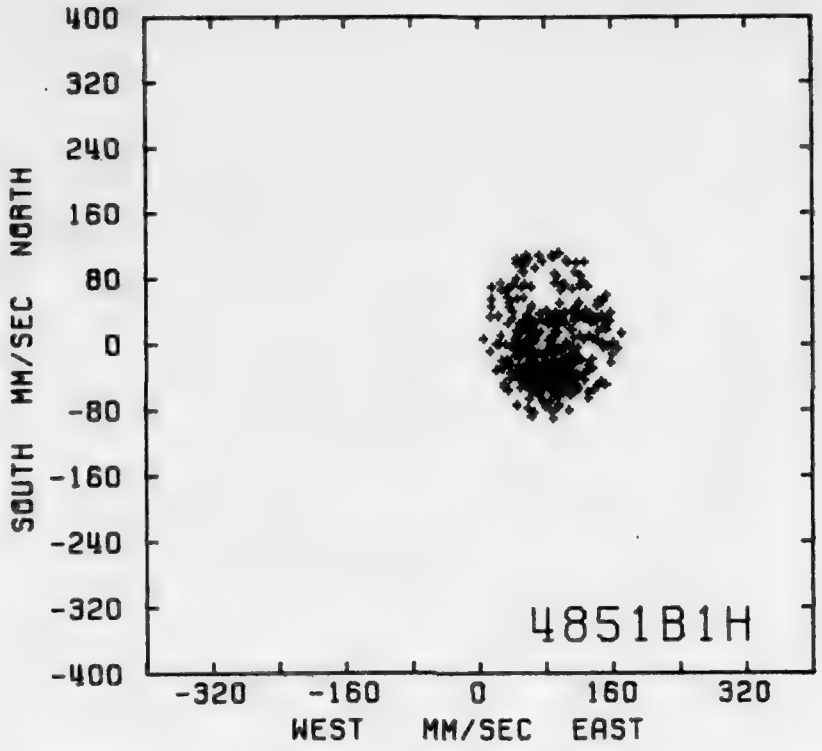
SAMPLE SIZE = 1596 POINTS



AUTO SPECTRUM
48518900 TEMPERATURE
421 METERS
73-III-14 TO 73-III-30
1 PIECES WITH 768 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS



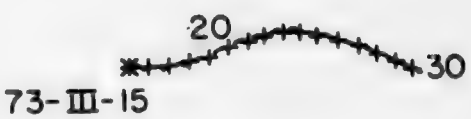
AUTO SPECTRUM
48518900 EAST
48518900 NORTH
421 METERS
73-III-14 TO 73-III-30
1 PIECES WITH 768 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS

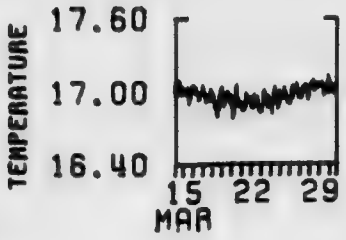


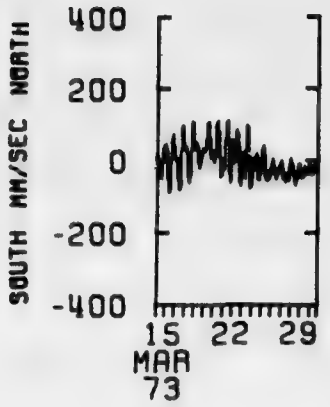
4851B900

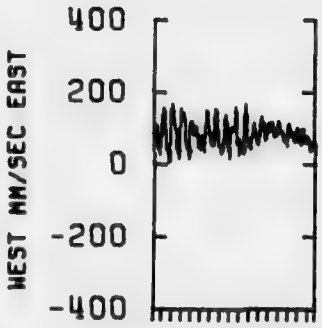
421 M

73- III-15 TO 73- III-30



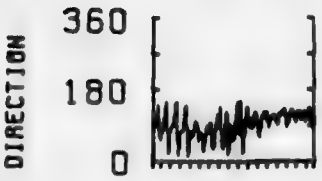


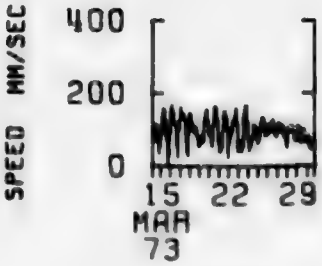




4851B1H

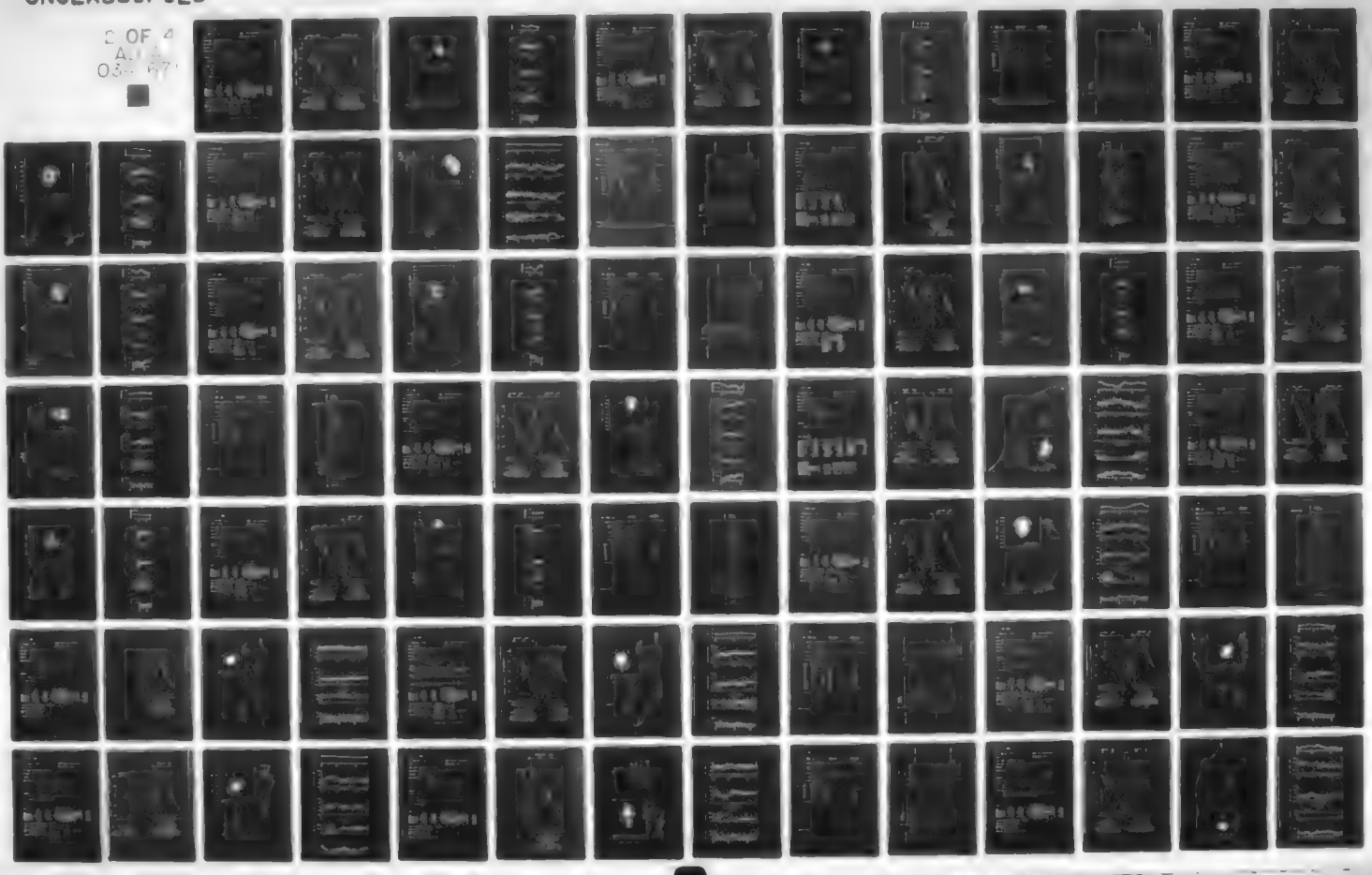
421 M





AD-A034 671 WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS F/G 8/3
A COMPILATION OF MOORED CURRENT DATA AND ASSOCIATED OCEANOGRAPH--ETC(U)
NOV 76 D CHAUSSE, S TARBELL N00014-66-C-0241
UNCLASSIFIED WHOI-76-101 NL

2 OF 4
AD
034 671



DATA NUMBER 4853

Instrument No.: V-0155

Type: Vector Averaging Current Meter

Depth: 723 m

Water Depth: 5420 m

Start time: 73-March-14 04.07.30.

Stop time: 73-April-16 13.52.30.

Duration: 33d 9h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

Instrument owned by the Institute of Oceanographic Sciences

Compass - good

Vane - sticky from April 17 to recovery

Rotor - good

Temperature - good

STATS DATA/ 48530900A

	EAST	NORTH	SPEED	***** EAST & NORTH *****	
MEAN =	55.44	13.22	79.21	COVARIANCE =	-203.56
STD. ERR. =	.70	.88	.56	STD. ERR. OF COVARIANCE =	54.19
VARIANCE =	1585.11	2482.66	1021.17	STD. DEV. OF COVARIANCE =	3069.08
STD. DEV. =	39.81	49.63	31.96	CORRELATION COEFFICIENT =	-.103
KURTOSIS =	3.04	2.71	2.56	VECTOR MEAN =	56.99
SKEWNESS =	-.17	-.09	.13	VECTOR VARIANCE =	2023.89
				STD. DEV. =	44.99

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 3208 POINTS

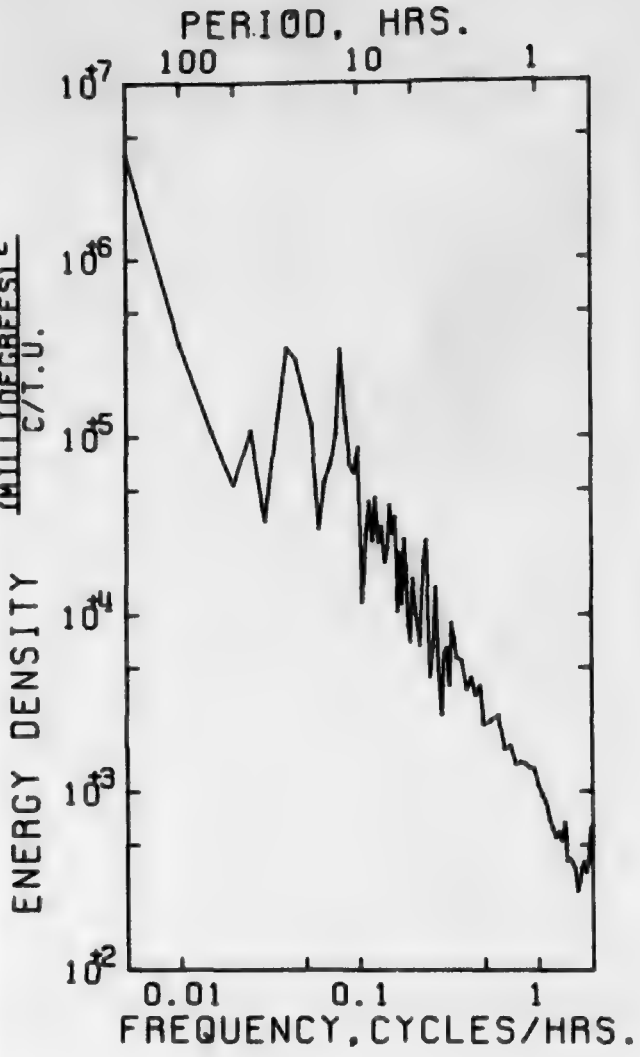
SPANNING RANGE
FROM 73- III-14 04.07.30
TO 73- IV -16 13.52.30

DURATION 33 DAYS 9 H 45 M

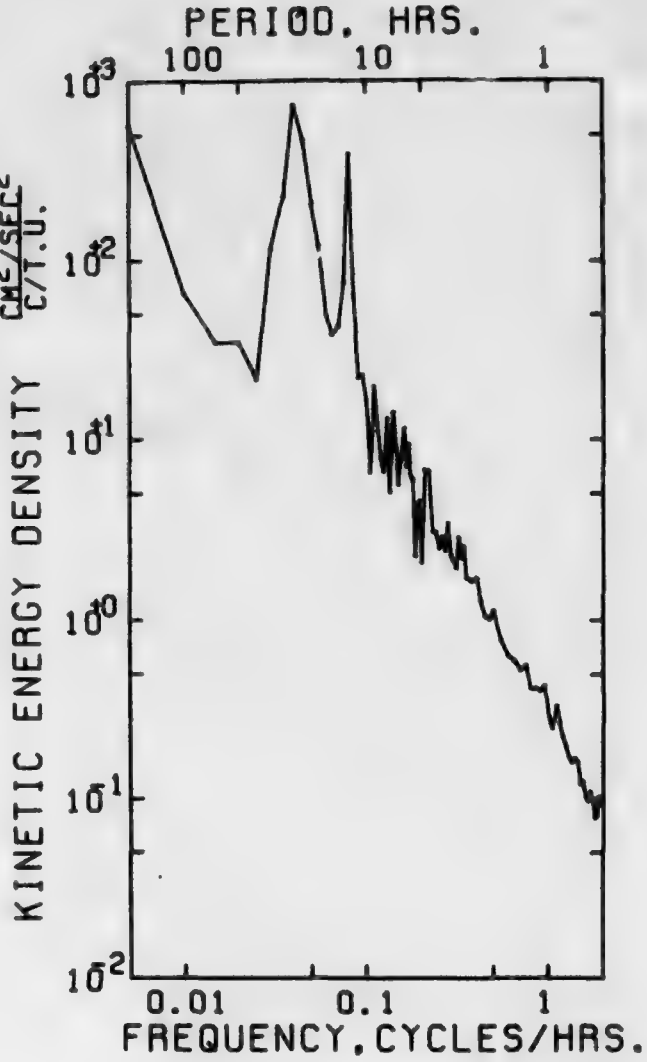
*** TEMPERATURE ***
*** DEGREES C. ***

MEAN = 11.331 STD ERR = .004
VARIANCE = .050
STD. DEV. = .223
KURTOSIS = 2.455
SKEWNESS = -.225

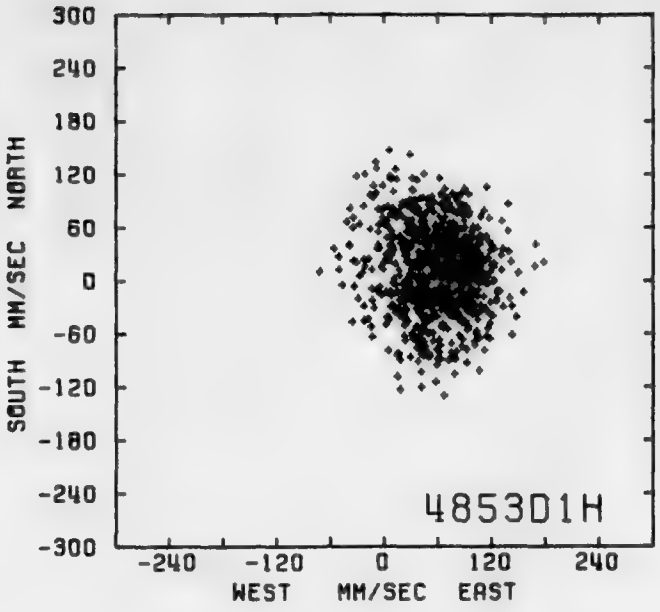
SAMPLE SIZE = 3205 POINTS

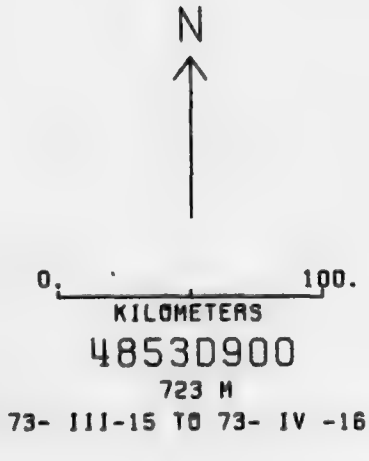


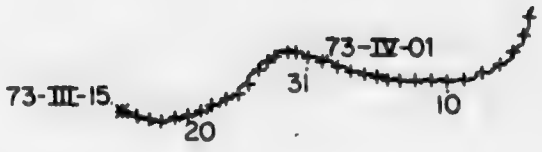
AUTO SPECTRUM
48530900 TEMPERATURE
723 METERS
73-III-14 TO 73-IV-16
1 PIECES WITH 1600 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS

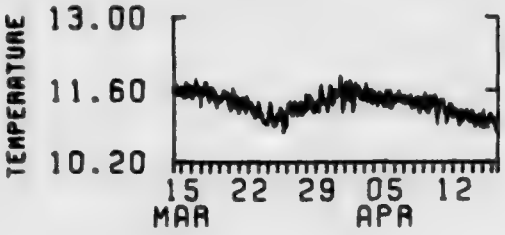


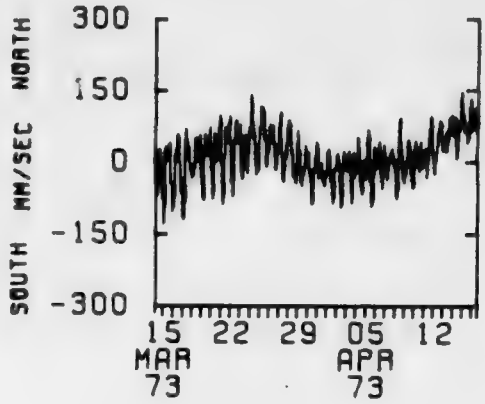
AUTO SPECTRUM
48530900 EAST
48530900 NORTH
723 METERS
73-III-14 TO 73-IV-16
1 PIECES WITH 1600 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS

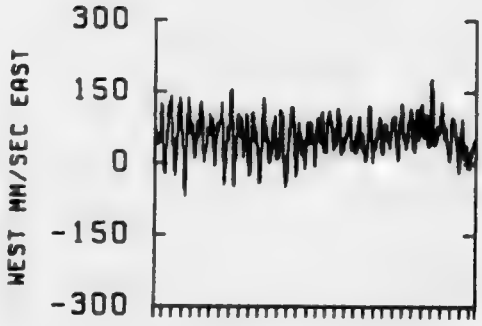

300
240
180
120
60
0
-60
-120
-180
-240
-300
SOUTH MM/SEC NORTH
-240
-120
0
120
240
WEST MM/SEC EAST
485301H


N
0.
100.
KILOMETERS
48530900
723 M
73- III-15 TO 73- IV -16


73-III-15
20
31
73-IV-01
10

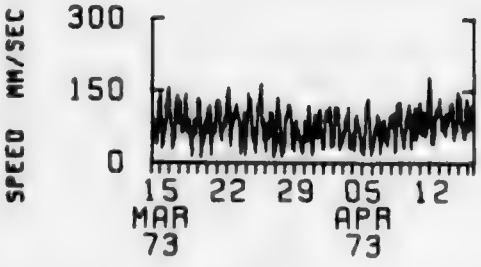






485301H

723 M



DATA NUMBER 4856

Instrument No.: V-0139 Type: Vector Averaging Current Meter

Depth: 1426 m Water Depth: 5420 m

Start time: 73-March-14 04.07.30.

Stop time: 73-March-28 10.52.30.

Duration: 14d 6h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

Compass - good

Vane - sticky or stuck from March 28 to end

Rotor - good

Temperature - good

STATS DATA/ 4856C900A

	EAST	NORTH	SPEED	***** EAST & NORTH	*****
MEAN =	14.27	4.60	38.42	COVARIANCE =	-105.22
STD. ERR. =	.75	.74	.38	STD. ERR. OF COVARIANCE =	22.62
VARIANCE =	774.24	760.57	205.61	STD. DEV. OF COVARIANCE =	837.89
STD. DEV. =	27.83	27.58	14.34	CORRELATION COEFFICIENT =	-.137
KURTOSIS =	2.87	2.28	3.14	VECTOR MEAN =	15.00
SKEWNESS =	-.47	.10	.87	VECTOR VARIANCE =	787.41
				STD. DEV. =	27.70

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 1372 POINTS

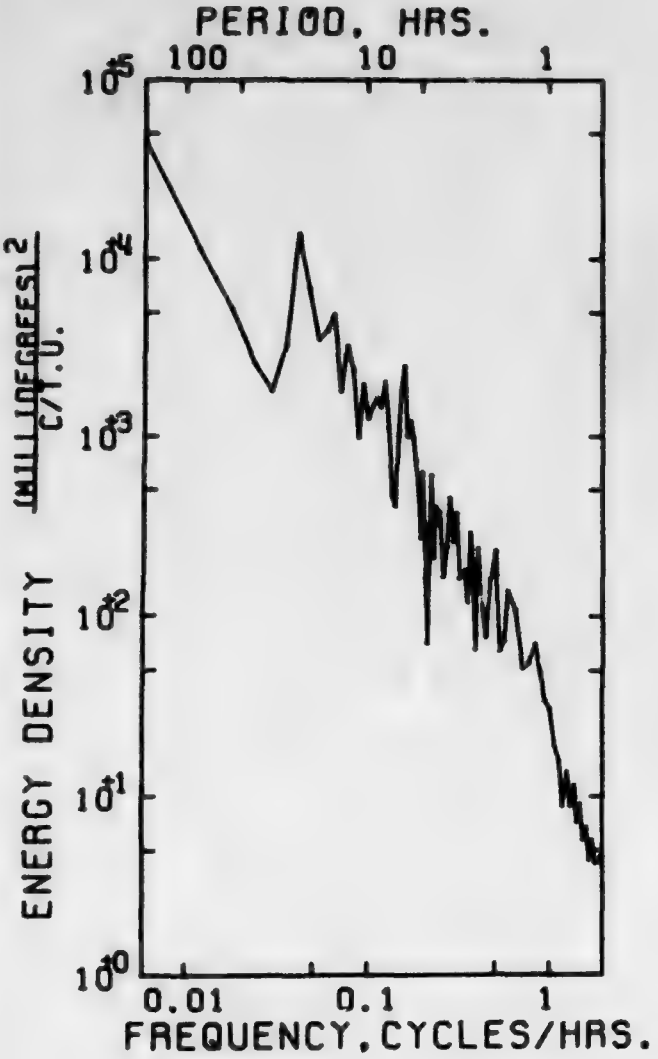
SPANNING RANGE
FROM 73- III-14 04.07.30
TO 73- III-28 10.52.30

DURATION 14 DAYS 6 H 45 M

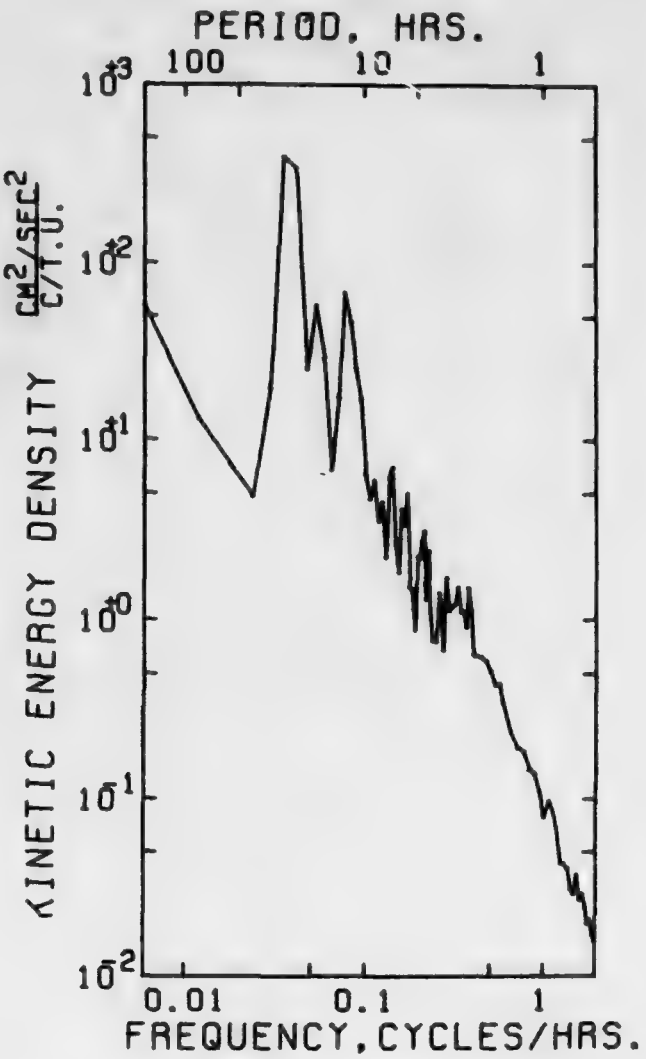
*** TEMPERATURE ***
*** DEGREES C. ***

MEAN =	4.503	STD ERR =	.001
VARIANCE =	.001		
STD. DEV. =	.025		
KURTOSIS =	3.034		
SKEWNESS =	.025		

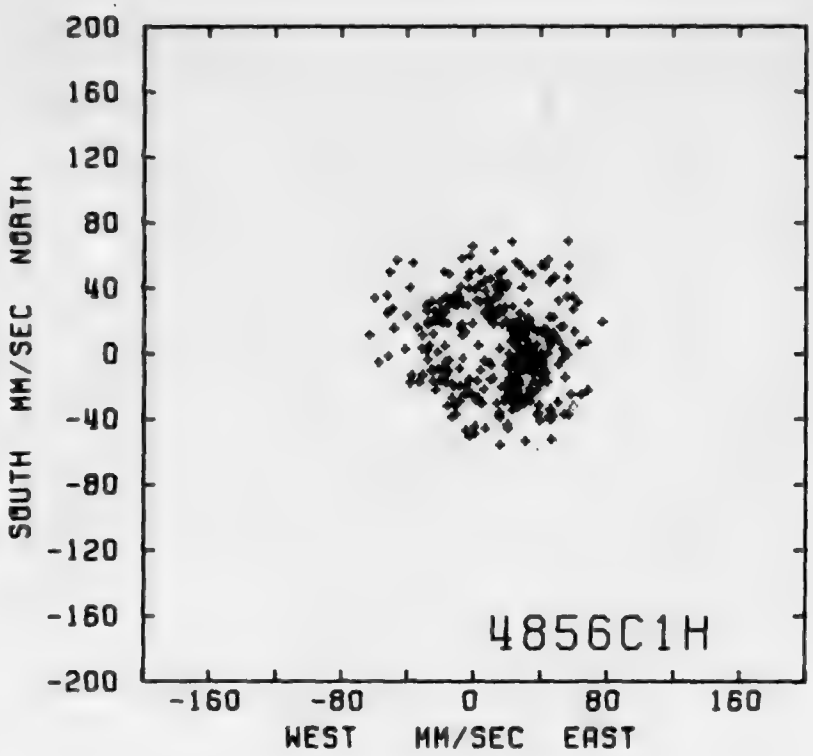
SAMPLE SIZE = 1372 POINTS



AUTO SPECTRUM
4856C900 TEMPERATURE
1426 METERS
73-III-14 TO 73-III-28
1 PIECES WITH 675 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS



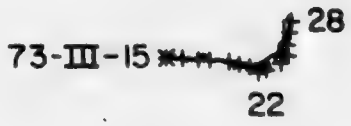
AUTO SPECTRUM
4856C900 EAST
4856C900 NORTH
1426 METERS
73-III-14 TO 73-III-28
1 PIECES WITH 675 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS

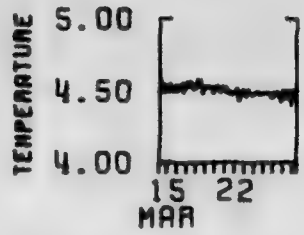


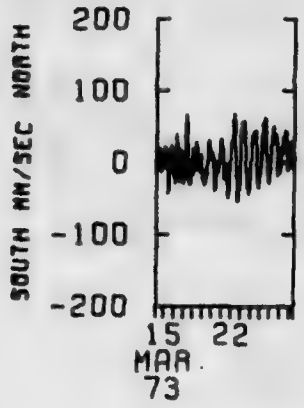
4856C900

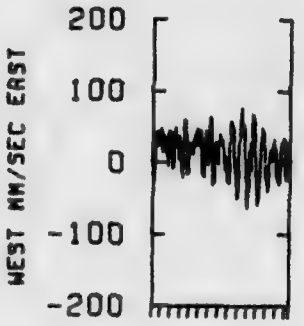
1426 M

73- III-15 TO 73- III-28



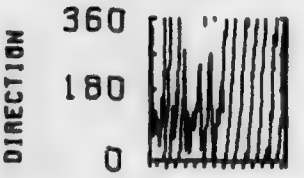


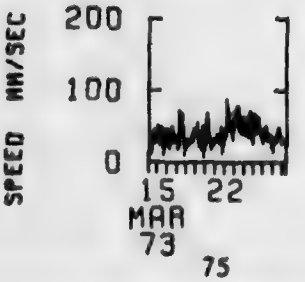




4856C1H

1426 M





Mooring No. 486

Set 1973 Mar 14 (Year Month Day) 26° 57.5'N (Latitude) 71° 02.6'W (Longitude)

Set by J. Gifford - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 1

Retrieved 1973 July 2 (Year Month Day)

Retrieved by G. Tupper - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 6

Purpose of Mooring: Mooring #12 of MODE 1 array

Mooring Type: Subsurface

Key	Data Number	Instrument Number	Type	Depth Meters	Comments
	4861	V-0131	VACM	415	
	4862	#40	T/P	519	M.I.T., tape fouled
	4863	V-0172	VACM	715	U.R.I., tape unreadable
*	4864	V-0124	VACM	1420	
*	4865	V-0106	VACM	2940	
#	4866	#28	T/P	3948	M.I.T.
	4867	H-877	Film	5372	Nova University, Florida
	Water depth			5474	

COMMENTS ON MOORING:

MODE cameraman overboard in Zodiac to take pictures of a launch. A tanker passed 2.3 miles astern of us during tow of mooring. It crossed the mooring line between item 20 (8 glass balls) and item 26 (5 glass balls). No apparent damage.

STATION 486

RADIO FLOAT WITH LIGHT
2m 1/2" CHAIN
2m 3/8" CHAIN
12 17" GLASS BALLS IN HARD HATS ON 12m 3/8" CHAIN
VACM. - 4861
2m 3/8" CHAIN
96m 3/16" WIRE
3m 3/8" CHAIN
T/P — 4862
196m 3/16" WIRE
VACM - 4863
2m 3/8" CHAIN
198m 3/16" WIRE
1m 3/8" CHAIN
199m 3/16" WIRE
1m 3/8" CHAIN
280m 3/16" WIRE
8 17" GLASS BALLS IN HARD HATS ON 15m 3/8" CHAIN
VACM - 4864
500m 3/16" WIRE
3/8" DACRON
37m
457m
457m
5 17" GLASS BALLS IN HARD HATS ON 5m 3/8" CHAIN
(CONTINUED)
(CONTINUED)
VACM - 4865
41m
458m
457m
T/P — 4866
3m
3/8" DACRON
71m
339m
455m
445m
CURRENT METER - 4867
55m
13 17" GLASS BALLS IN HARD HATS ON 13m 3/8" CHAIN
ACOUSTIC RELEASE, TRANSPONDING
20m 3/4" NYLON
3m 1/2" CHAIN
STIMSON ANCHOR 2690 LBS.

DATA NUMBER 4864

Instrument No.: V-0184 **Type:** Vector Averaging Current Meter

Depth: 1420 m **Water Depth:** 5474 m

Start Time: 73-March-14 15.07.30

Stop Time: 73-April-17 05.52.30

Duration: 33d 10h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:
Compass - good

Vane - stuck from April 17th to recovery

Rotor - good

Temperature - good

STATS DATA/ 4864C900A

	EAST	NORTH	SPEED
MEAN =	7.13	1.78	42.87
STD. ERR. =	.54	.58	.27
VARIANCE =	847.10	1088.51	229.71
STD. DEV. =	30.77	32.88	15.16
KURTOSIS =	2.43	2.43	2.67
SKEWNESS =	-.33	-.25	.58

***** EAST & NORTH *****	
COVARIANCE =	126.21
STD. ERR. OF COVARIANCE =	14.80
STD. DEV. OF COVARIANCE =	844.18
CORRELATION COEFFICIENT =	.128
VECTOR MEAN =	7.35
VECTOR VARIANCE =	1008.80
STD. DEV. =	31.75

UNITS OF RAW DATA VARIABLES = *** TEMPERATURE ***
*** DEGREES C. ***

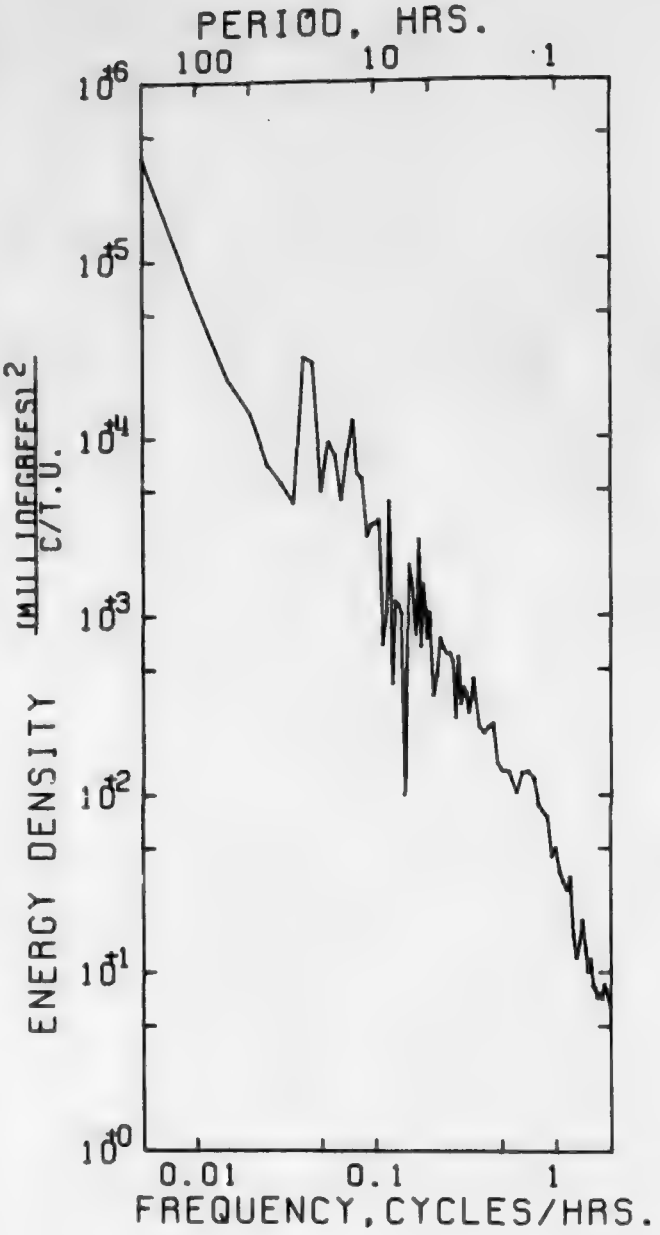
SAMPLE SIZE = 3212 POINTS

SPANNING RANGE
FROM 73- III-14 18.07.30
TO 73- IV -17 05.52.30

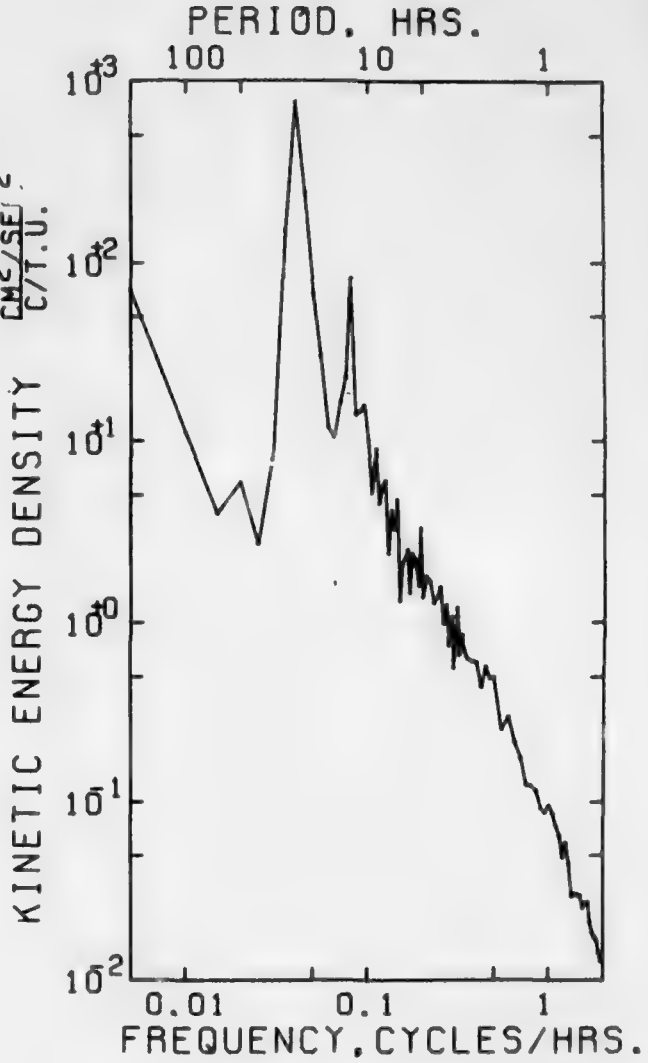
DURATION 33 DAYS 10 H 45 M

MEAN =	4.718	STD ERR =	.003
VARIANCE =	.018		
STD. DEV. =	.043		
KURTOSIS =	2.214		
SKEWNESS =	-.224		

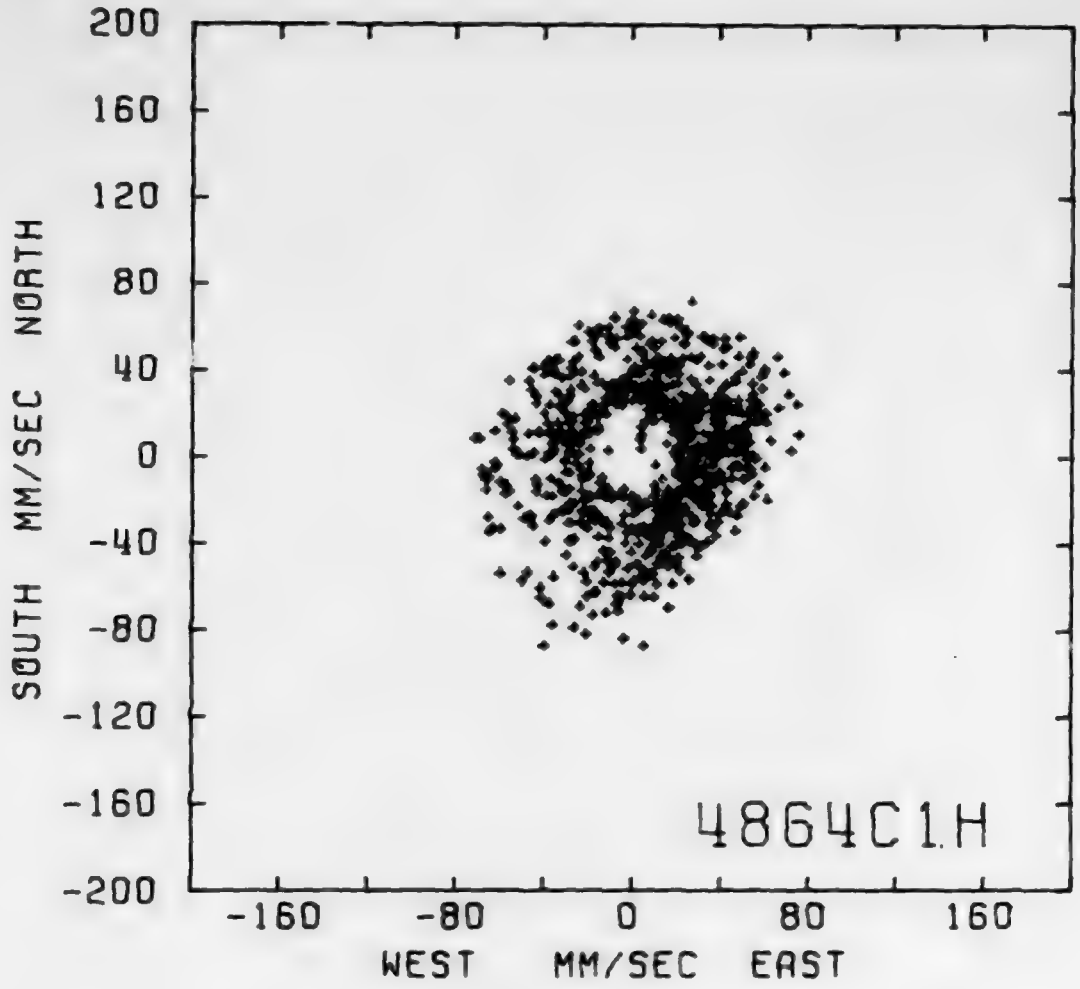
SAMPLE SIZE = 321 POINTS



AUTO SPECTRUM
4864C900 TEMPERATURE
1420 METERS
73-III-15 TO 73-IV-17
1 PIECES WITH 1600 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS



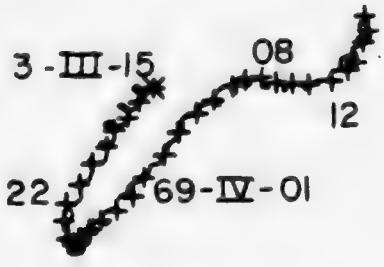
AUTO SPECTRUM
4864C900 EAST
4864C900 NORTH
1420 METERS
73-III-14 TO 73-IV-17
1 PIECES WITH 1600 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS

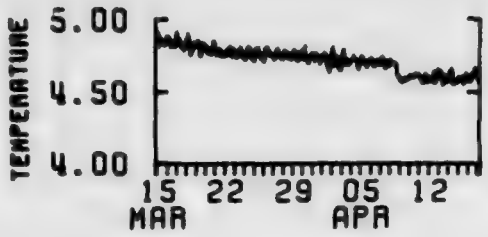


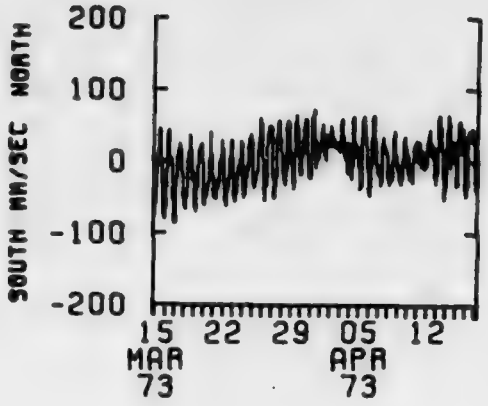
4864C900

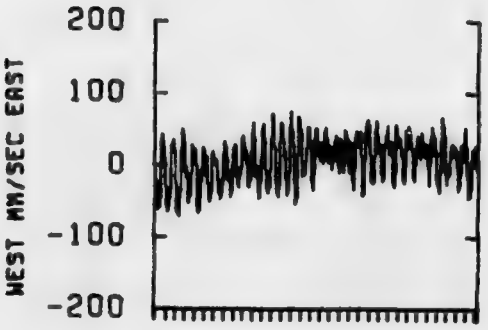
1420 M

73- III-15 TO 73- IV -17



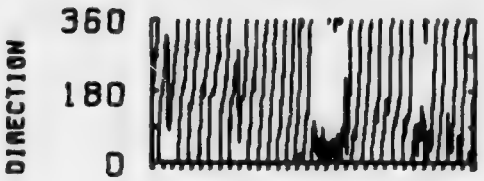


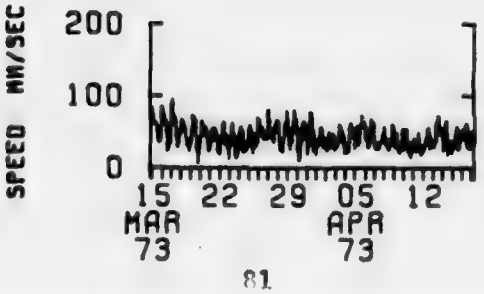




4864C1H

1420 M





DATA NUMBER 4865

Instrument No.: V-0106 Type: Vector Averaging Current Meter

Depth: 2940 m Water Depth: 5474 m

Start time: 73-March-15 07.07.30.

Stop time: 73-July-01 23.52.30.

Duration: 108d 16h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

All variables look good entire record

STATS DATA/ 4865C900R

	EAST	NORTH	SPEED	##### EAST & NORTH	#####
MEAN =	-14.67	-12.66	59.13	COVARIANCE =	328.42
STD. ERR. =	.29	.24	.17	STD. ERR. OF COVARIANCE =	8.05
VARIANCE =	868.94	585.44	308.97	STD. DEV. OF COVARIANCE =	821.88
STD. DEV. =	28.44	24.40	17.52	CORRELATION COEFFICIENT =	.457
KURTOSIS =	2.58	2.84	3.37	VECTOR MEAN =	19.38
SKEWNESS =	-.05	.45	1.00	VECTOR VARIANCE =	791.19
				STD. DEV. =	27.04

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 10436 POINTS

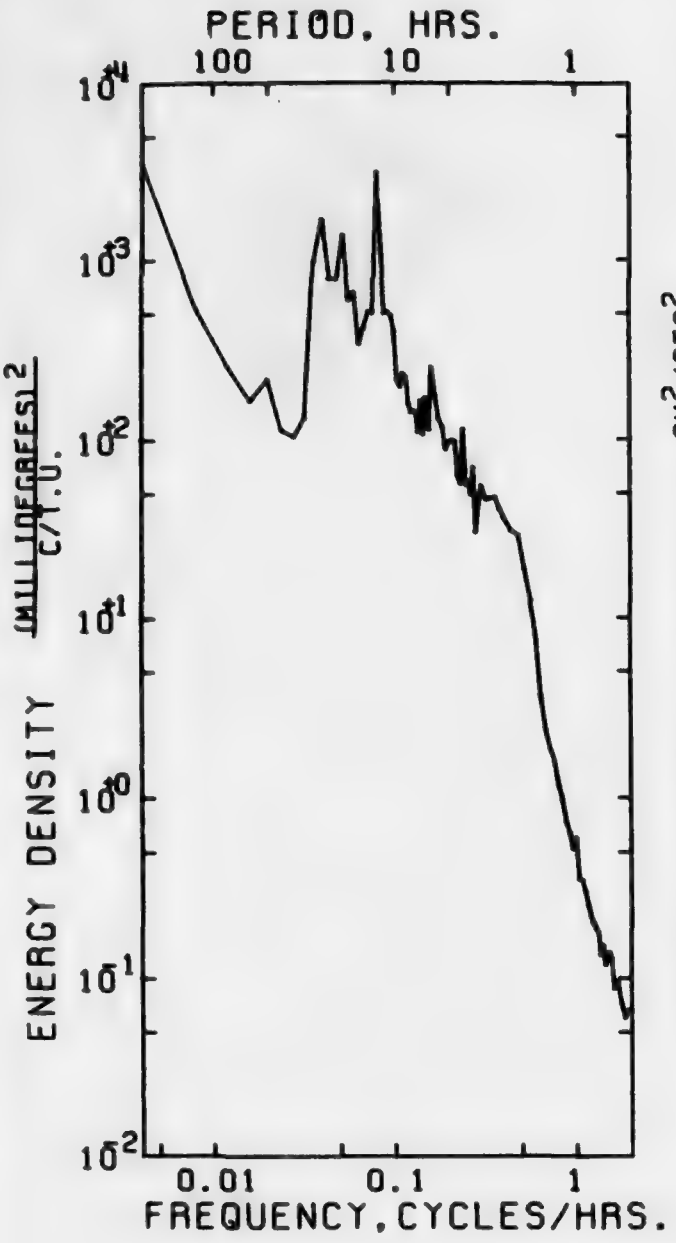
SPANNING RANGE
FROM 73- III-15 07.07.30
TO 73- VII-01 23.52.30

DURATION 108 DAYS 16 H 45 M

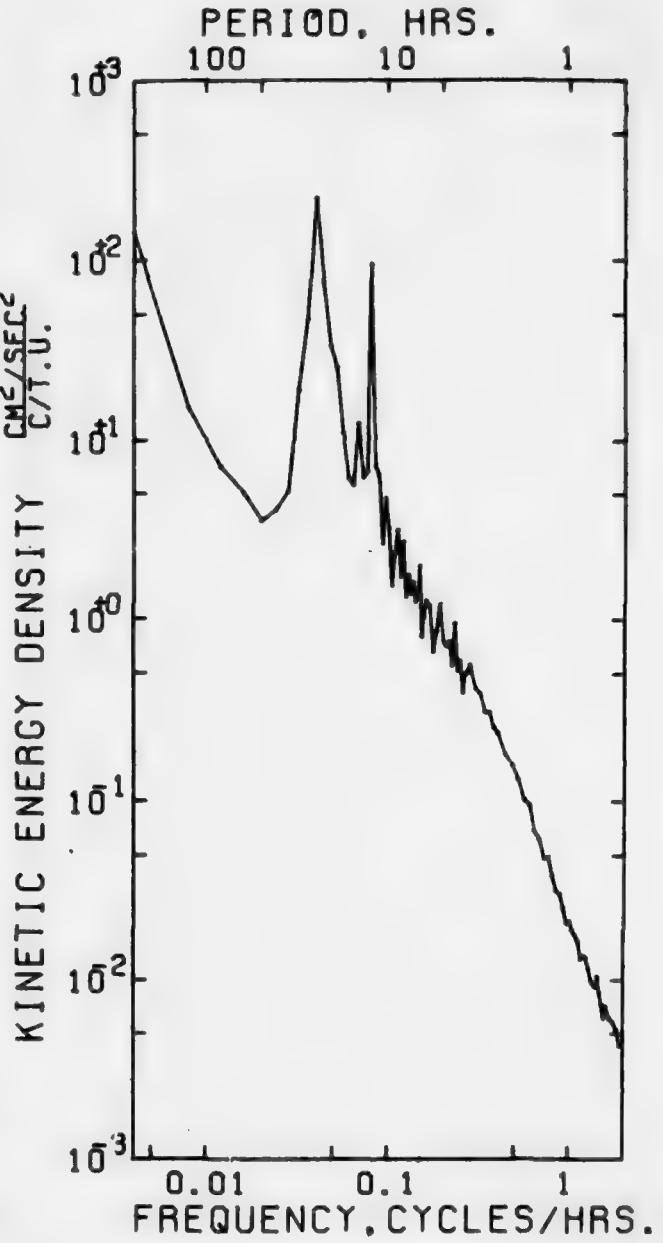
*** TEMPERATURE ***
*** DEGREES C. ***

MEAN =	2.799	STD ERR =	.000
VARIANCE =	.000		
STD. DEV. =	.016		
KURTOSIS =	2.528		
SKEWNESS =	-.107		

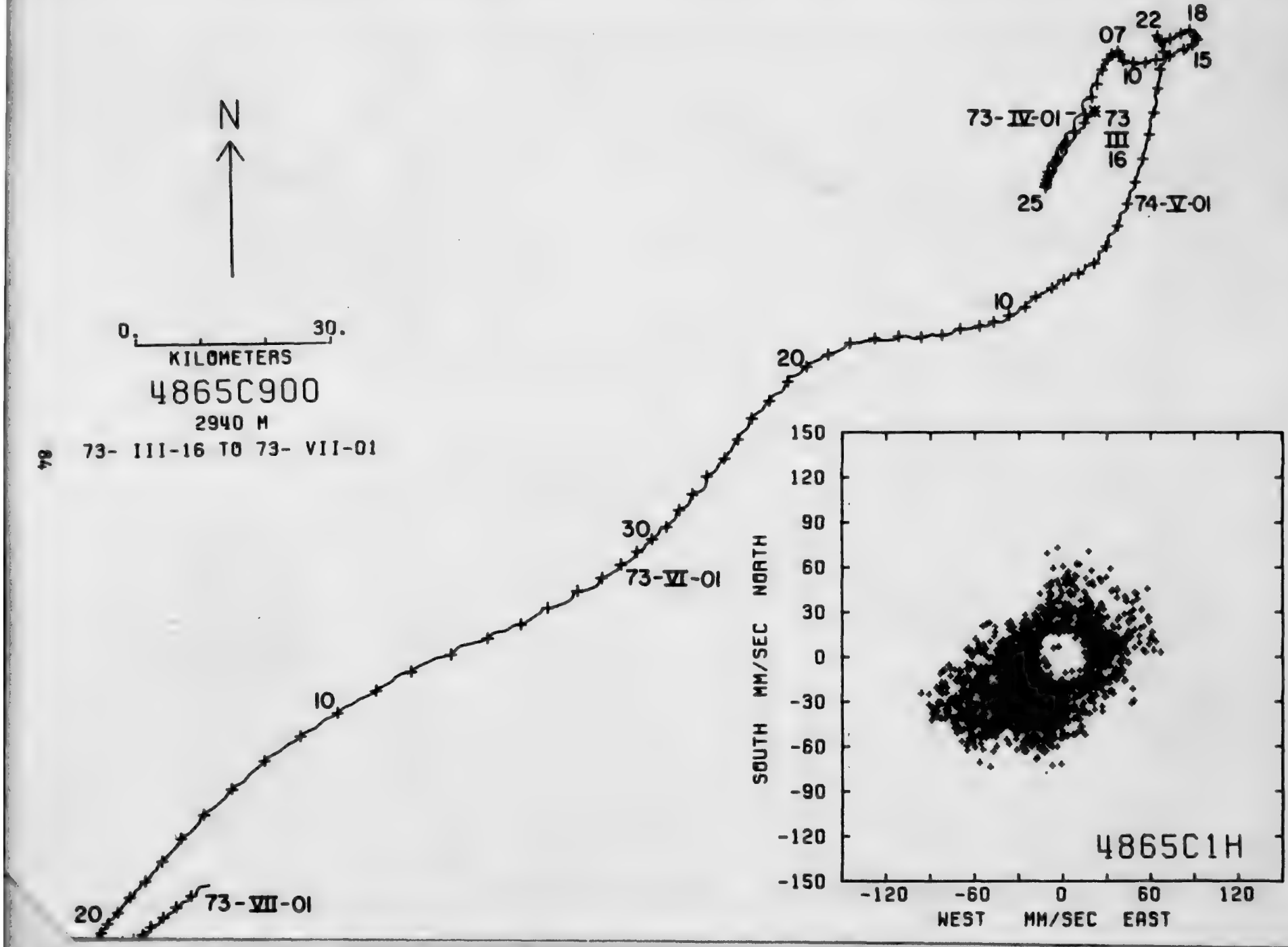
SAMPLE SIZE = 10436 POINTS

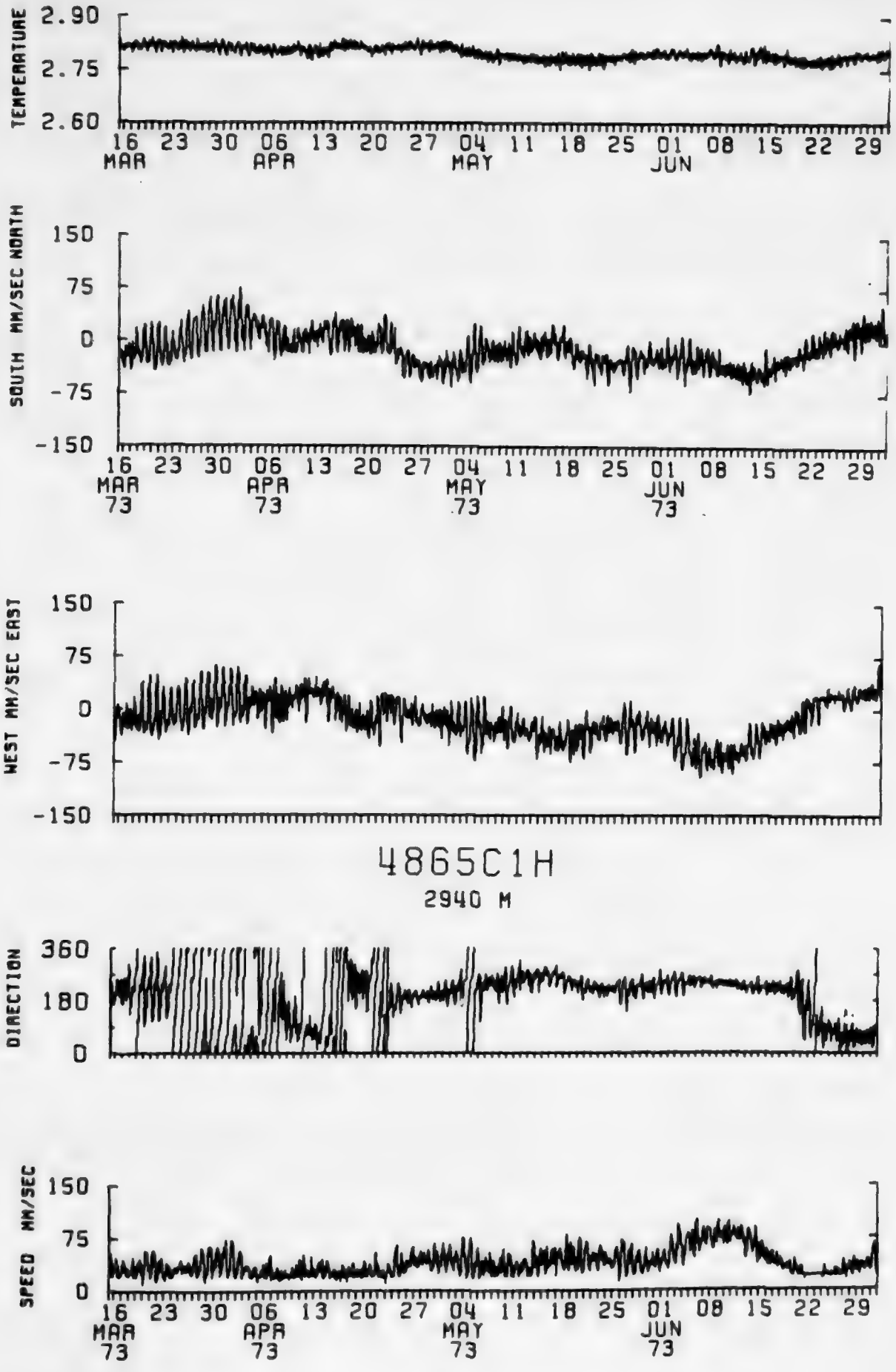


AUTO SPECTRUM
4865C900 TEMPERATURE
2940 METERS
73-III-15 TO 73-VI-06
1 PIECES WITH 4000 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
4865C900 EAST
4865C900 NORTH
2940 METERS
73-III-15 TO 73-VI-06
1 PIECES WITH 4000 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS


N
0.
30.
KILOMETERS
4865C900
2940 M
73- III-16 TO 73- VII-01
07
22
18
15
10
73-IV-01
73
III
16
25
74-V-01
10
20
30
73-VI-01
10
20
73-VII-01
150
120
90
60
30
0
-30
-60
-90
-120
-150
SOUTH MM/SEC NORTH
-120
-60
0
60
120
WEST MM/SEC EAST
4865C1H


TEMPERATURE
2.90
2.75
2.60
16 23 30 06 13 20 27 04 11 18 25 01 08 15 22 29
MAR APR MAY JUN
SOUTH MM/SEC NORTH
150
75
0
-75
-150
16 23 30 06 13 20 27 04 11 18 25 01 08 15 22 29
MAR 73 APR 73 MAY 73 JUN 73
WEST MM/SEC EAST
150
75
0
-75
-150
4865C1H
2940 M
DIRECTION
360
180
0
SPEED MM/SEC
150
75
0
16 23 30 06 13 20 27 04 11 18 25 01 08 15 22 29
MAR 73 APR 73 MAY 73 JUN 73

Mooring No. 488

Set 1973 Mar 15 (Year Month Day) 28° 31.1'N (Latitude) 71° 22.9'W (Longitude)

Set by G. Tupper - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 1

Retrieved 1973 July 01 (Year Month Day)

Retrieved by J. Gifford - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 6

Purpose of Mooring: Mooring #13 of MODE 1 array

Mooring Type: Subsurface

Key	Data Number	Instrument Number	Type	Depth Meters	Comments
▪	4881	V-0109	VACM	419	No temperature data
▮	4882	#41	T/P	521	M.I.T.
*	4883	V-0132	VACM	719	I.O.S.
	4884	V-0137	VACM	1429	No recoverable data
*	4885	V-0183	VACM	2952	
▮	4886	#29	T/P	3972	M.I.T.
	4887	H-302	Film	5226	Nova University, Florida
	Water depth			5325	

COMMENTS ON MOORING:

The 3/4" nylon just below the release on mooring 487 parted before the anchor reached the bottom. The mooring was retrieved and reset with a new mooring number (488).

STATION 488

RADIO FLOAT
WITH LIGHT
2m 1/2" CHAIN
2m 3/8" CHAIN
12 17" GLASS BALLS IN HARD HATS ON 12m 3/8" CHAIN
VACM - 4881
2m 3/8" CHAIN
96m 3/16" WIRE
3m 3/8" CHAIN
T/P — 4882
196m 3/16" WIRE
VACM - 4883
2m 3/8" CHAIN
198m 3/16" WIRE
1m 3/8" CHAIN
199m 3/16" WIRE
1m 3/8" CHAIN
280m 3/16" WIRE
8 17" GLASS BALLS IN HARD HATS ON 15m 3/8" CHAIN
VACM - 4884
500m 3/16" WIRE
3/8" DACRON
456m
456m
35m
(CONTINUED)
5 17" GLASS BALLS IN HARD HATS ON 5m 3/8" CHAIN
VACM - 4885
456m
456m
34m
11m
T/P — 4886
457m
458m
280m
3/8" DACRON
CURRENT METER - 4887
42m
13m
13 17" GLASS BALLS IN HARD HATS ON 13m 3/8" CHAIN
ACOUSTIC RELEASE, TRANSPONDING
20m 3/4" NYLON
3m 1/2" CHAIN
STIMSON ANCHOR, 2400 LBS.

DATA NUMBER 4881

Instrument No.: V-0109 Type: Vector Averaging Current Meter

Depth: 419 m Water Depth: 5325 m

Start time: 73-April-03 12.07.30

Stop time: 73-April-24 12.07.30

Duration: 21d

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

Compass - good

Vane - stuck from May 7 to recovery

Rotor - intermittent threshold areas starting at March 27

Temperature - no recoverable data

DATA/ 48818900

VARIABLE	EAST	NORTH	SPEED
UNITS	MM/SEC	MM/SEC	MM/SEC
MEAN	102.419	-116.913	158.517
STD. ERR.	1.269	1.407	1.773
VARIANCE	3318.718	3990.748	6340.295
STD. DEV.	57.608	63.172	79.626
KURTOSIS	2.127	1.997	2.090
SKEWNESS	.435	-.110	.151
MINIMUM	7.017	-271.890	20.000
MAXIMUM	234.222	-9.428	333.000

EAST & NORTH

COVARIANCE	-2820.941	
STD. ERR. OF COVARIANCE	287.980	
STD. DEV. OF COVARIANCE	13982.589	
CORRELATION COEFFICIENT	-.720	
VECTOR MEAN	155.430	
VECTOR VARIANCE	3654.739	
VECTOR STD. DEV.	60.454	

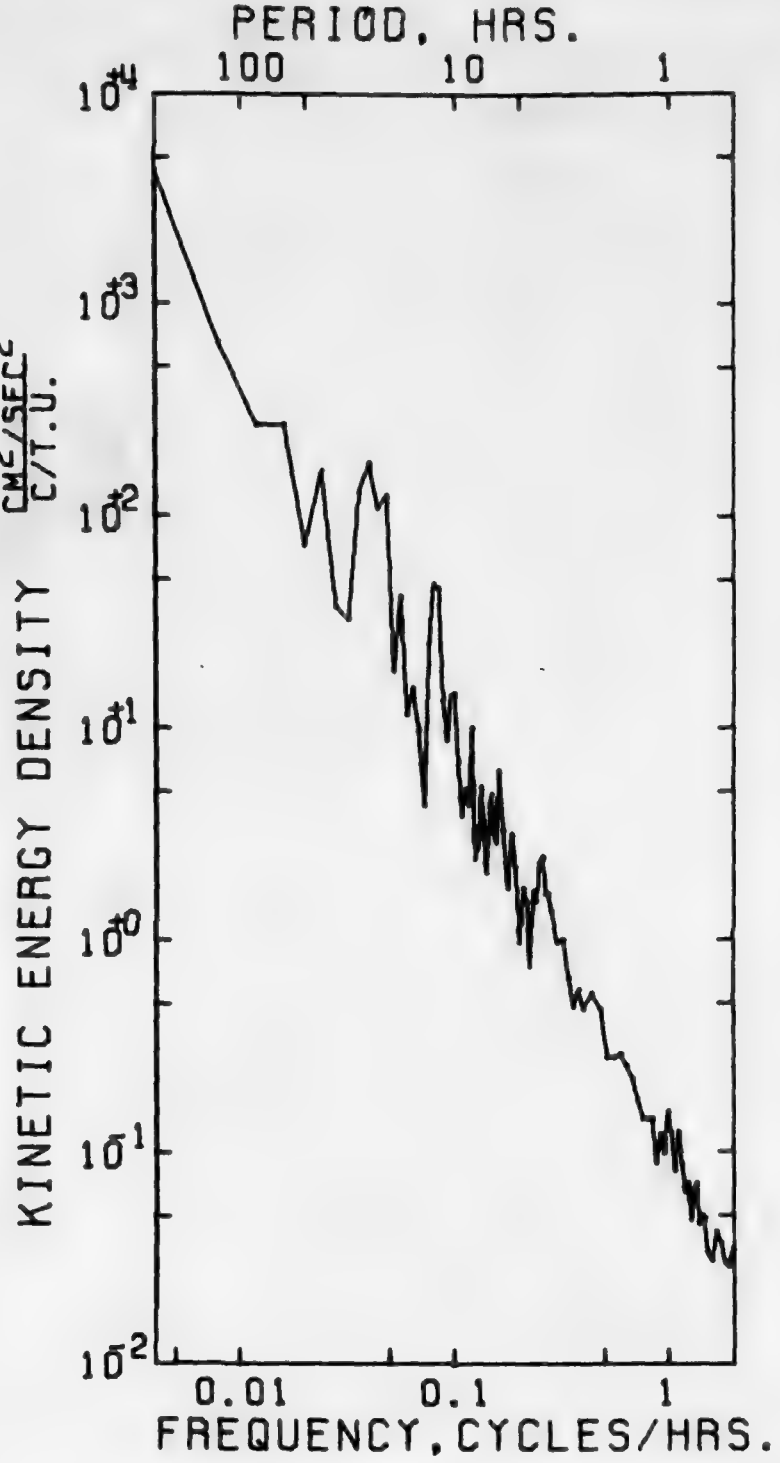
SAMPLE SIZE = 2017 POINTS

SPANNING RANGE

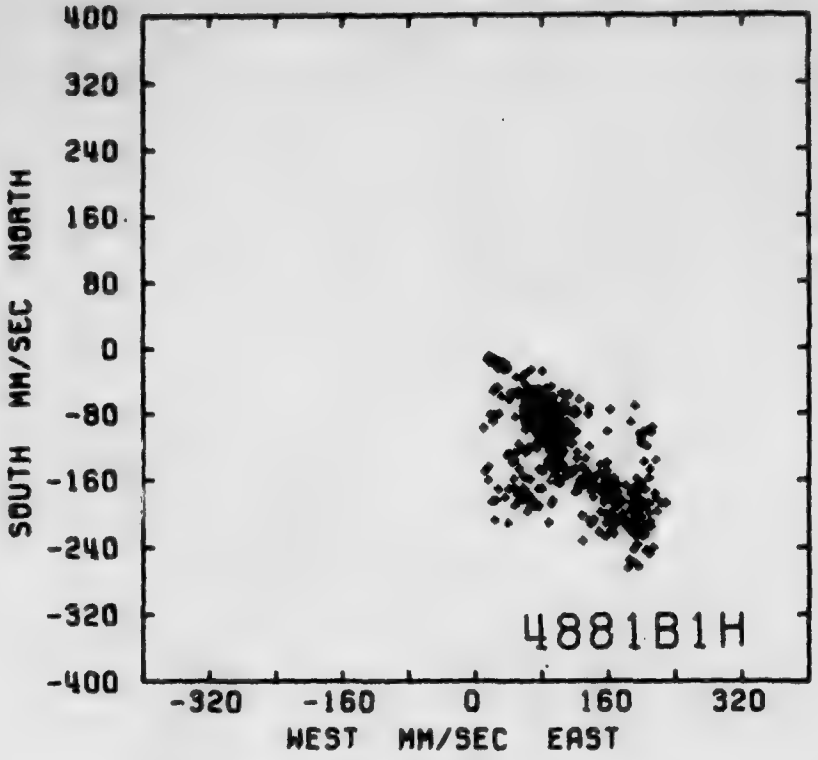
FROM 73- IV -03 12.07.30

TO 73- IV -24 12.07.30

DURATION 21.00 DAYS



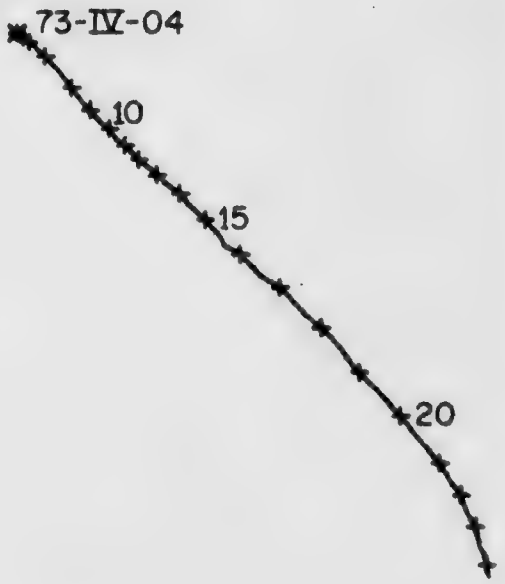
AUTO SPECTRUM
48818900 EAST
48818900 NORTH
507 METERS
73-IV-03 TO 73-IV-24
1 PIECES WITH 1000 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS

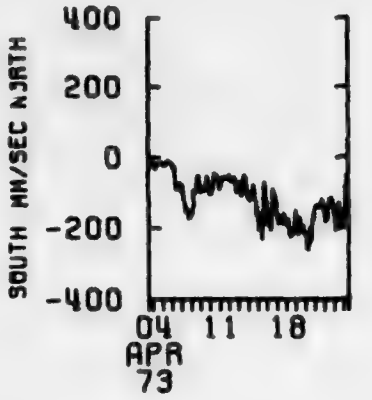


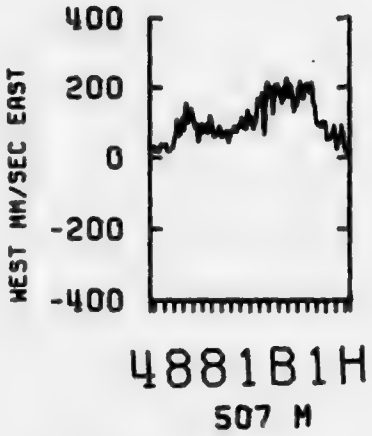
4881B900

507 M

73- IV -04 TO 73- IV -24

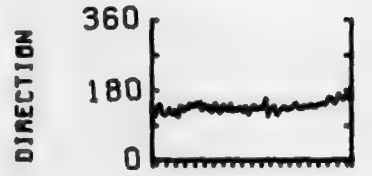


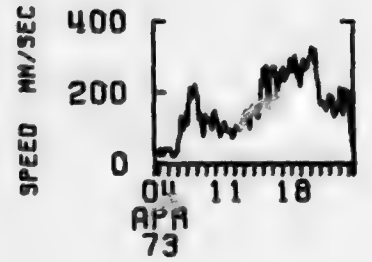




4881B1H

507 M





DATA NUMBER 4883

Instrument No.: V-0132 **Type:** Vector Averaging Current Meter

Depth: 719 m **Water Depth:** 5325 m

Start time: 73-March-15 18.07.30.

Stop time: 73-April-17 11.52.30.

Duration: 32d 17h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

Instrument owned by the Institute of Oceanographic Sciences

Compass - good

Vane - sticking from April 17 to April 22. Stuck from May 10 to recovery

Rotor - good until June 26 then drops to threshold values

Temperature - good

STATS DATA/ 4883C000A

	EAST	NORTH	SPEED	* ***** EAST & NORTH *****	
MEAN =	104.99	-62.49	134.54	* COVARIANCE =	-1087.35
STD. ERR. =	.86	1.08	.94	* STD. ERR. OF COVARIANCE =	150.50
VARIANCE =	2323.07	3857.89	2807.58	* STD. DEV. OF COVARIANCE =	8438.60
STD. DEV. =	48.20	60.48	52.99	* CORRELATION COEFFICIENT =	-.373
KURTOSIS =	2.54	2.55	2.22	* VECTOR MEAN =	122.18
SKEWNESS =	-.13	.32	.12	* VECTOR VARIANCE =	2990.48
				* STD. DEV. =	54.69

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 3144 POINTS

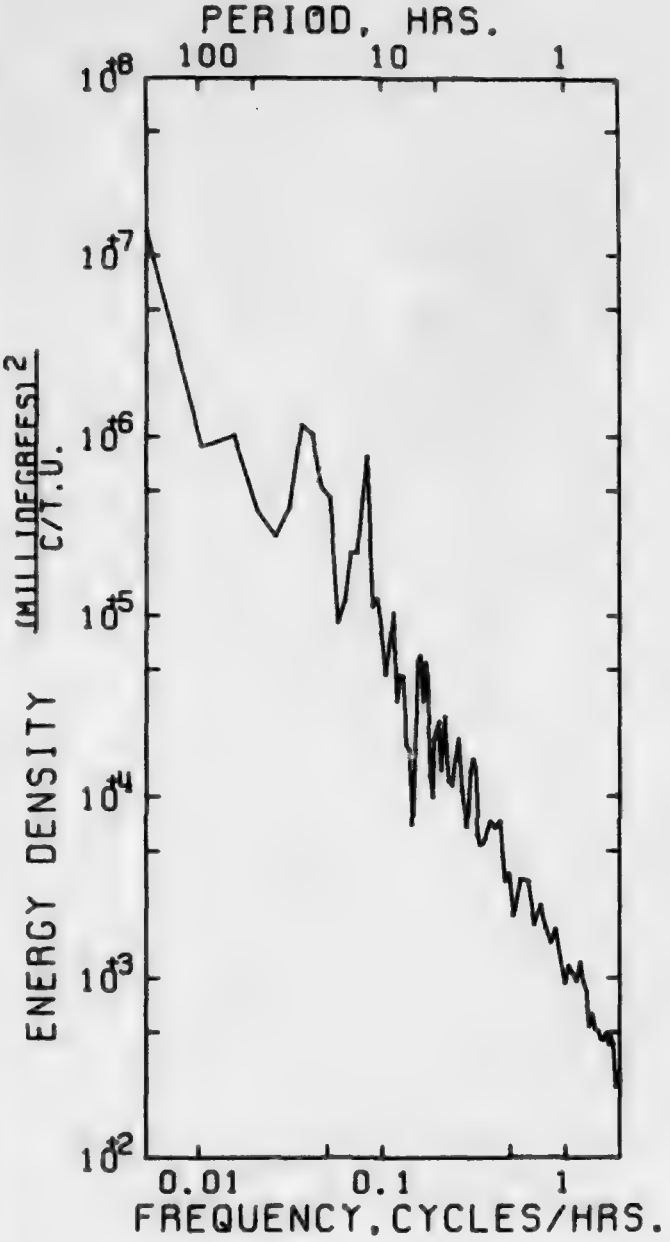
SPANNING RANGE
FROM 73- III-15 18.07.30
TO 73- IV -17 11.52.30

DURATION 32 DAYS 17 H 45 M

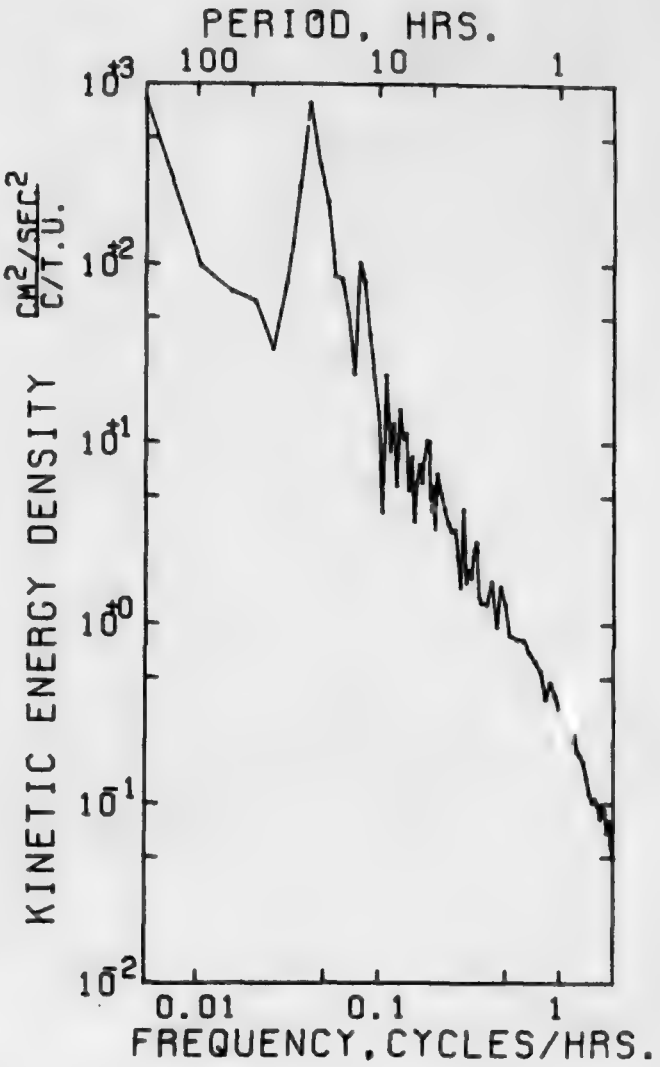
*** TEMPERATURE ***
*** DEGREES C. ***

MEAN = 12.273 STD ERR = .00[illegible]
VARIANCE = [illegible].228
STD. DEV. = .478
KURTOSIS = 2.415
SKEWNESS = -.345

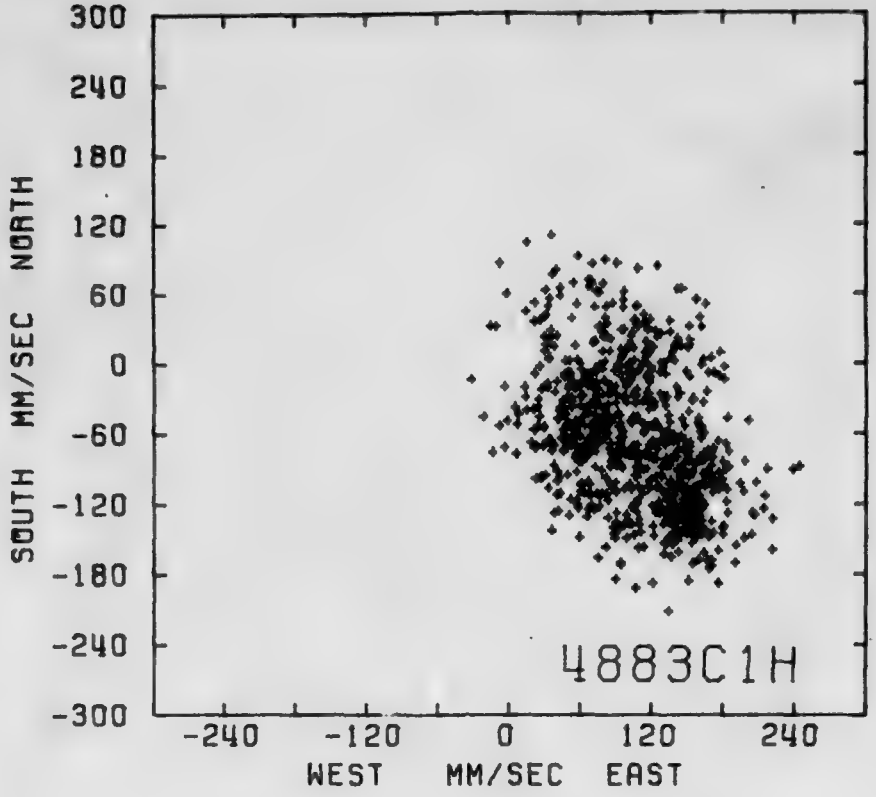
SAMPLE SIZE = 3144 POINTS

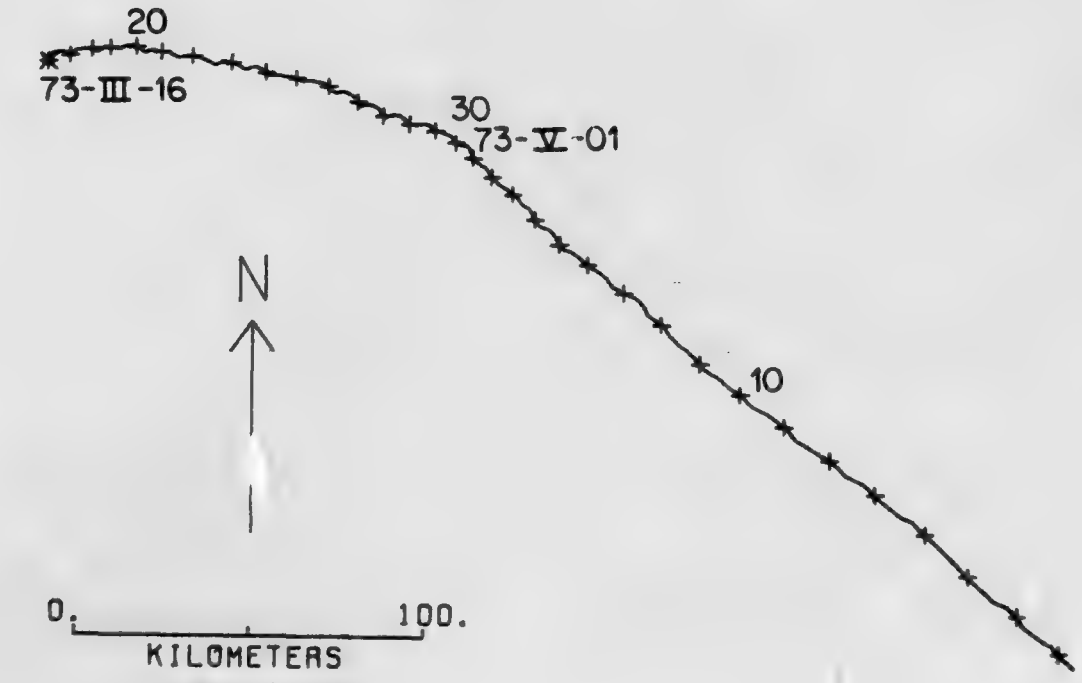


AUTO SPECTRUM
4883C900 TEMPERATURE
719 METERS
73-III-15 TO 73-IV-16
1 PIECES WITH 1536 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
4883C900 EAST
4883C900 NORTH
719 METERS
73-III-15 TO 73-IV-16
1 PIECES WITH 1536 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS

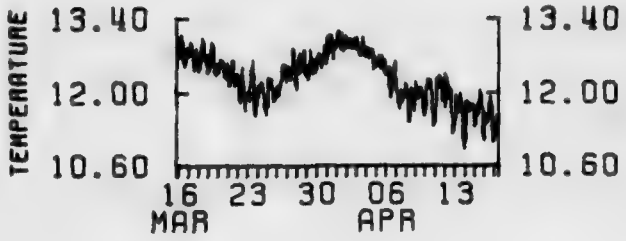


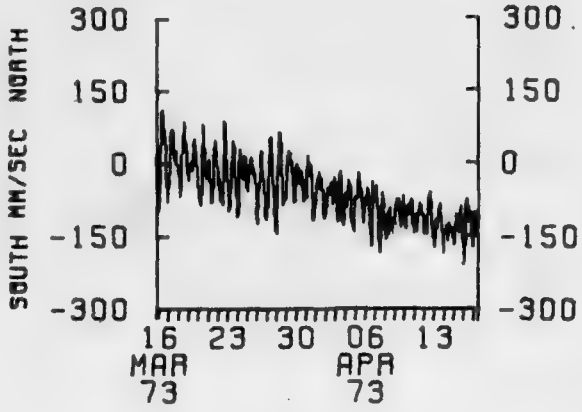


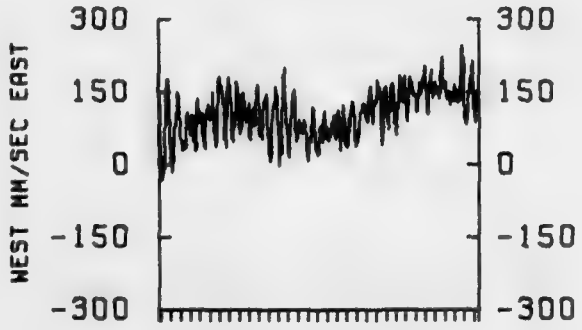
4883C900

719 M

73- III-16 TO 73- IV -17

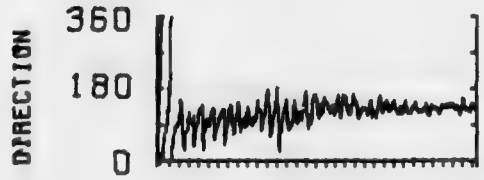


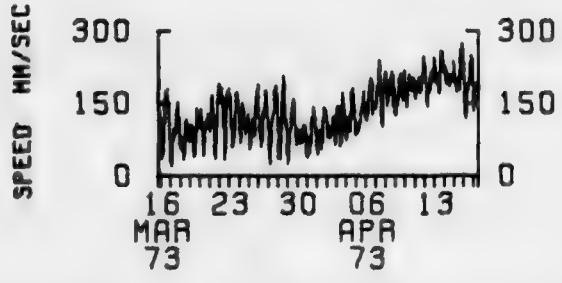




4883C1H

719 M





DATA NUMBER 4885

Instrument No.: V-0183 Type: Vector Averaging Current Meter

Depth: 2952 m Water Depth: 5325 m

Start time: 73-March-15 21.07.36.

Stop time: 73-April-07 19.52.30.

Duration: 22d 22h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

Compass - good

Vane - sticky from April 7 to recovery

Rotor - good

Temperature - good

STATS DATA/ 4885C900B

	EAST	NORTH	SPEED
MEAN =	.89	-45.77	58.48
STD. ERR. =	.67	.69	.52
VARIANCE =	880.16	1058.21	803.48
STD. DEV. =	31.47	32.50	24.57
KURTOSIS =	2.32	2.19	2.14
SKEWNESS =	.19	-.07	.35

##### EAST & NORTH	######
COVARIANCE =	-217.61
STD. ERR. OF COVARIANCE =	31.58
STD. DEV. OF COVARIANCE =	1481.52
CORRELATION COEFFICIENT =	-.213
VECTOR MEAN =	45.78
VECTOR VARIANCE =	1029.18
STD. DEV. =	31.88

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 2204 POINTS

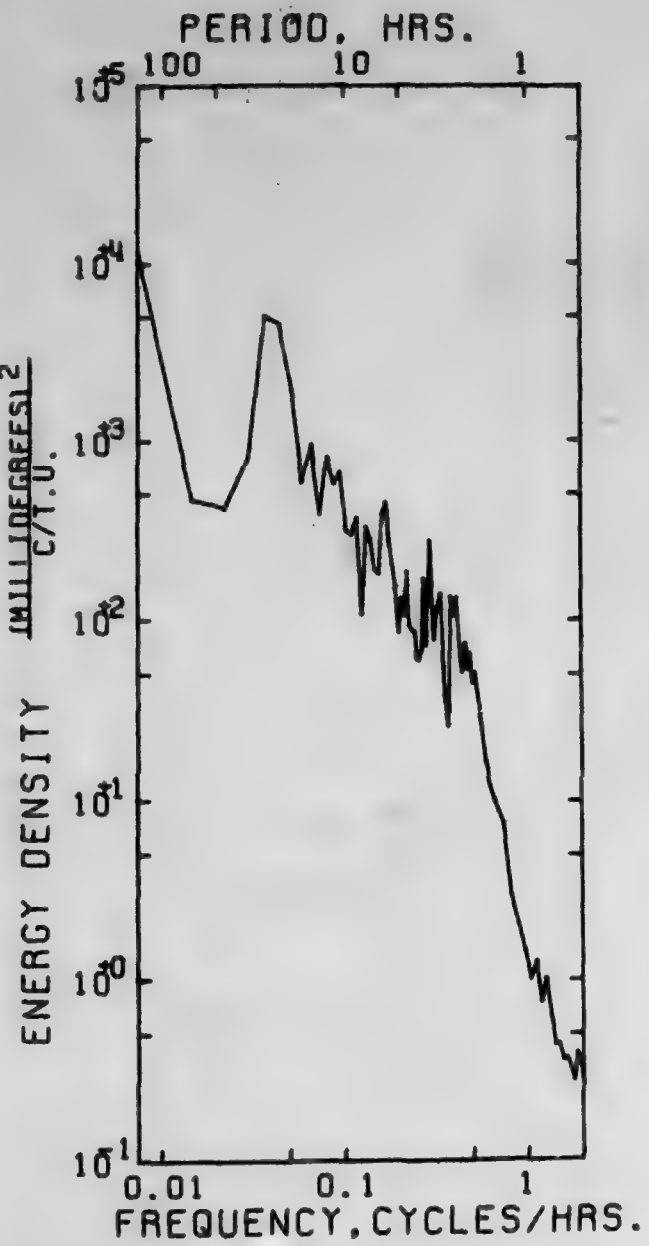
SPANNING RANGE
FROM 73- III-15 21.07.30
TO 73- IV -07 18.52.30

DURATION 22 DAYS 22 H 45 M

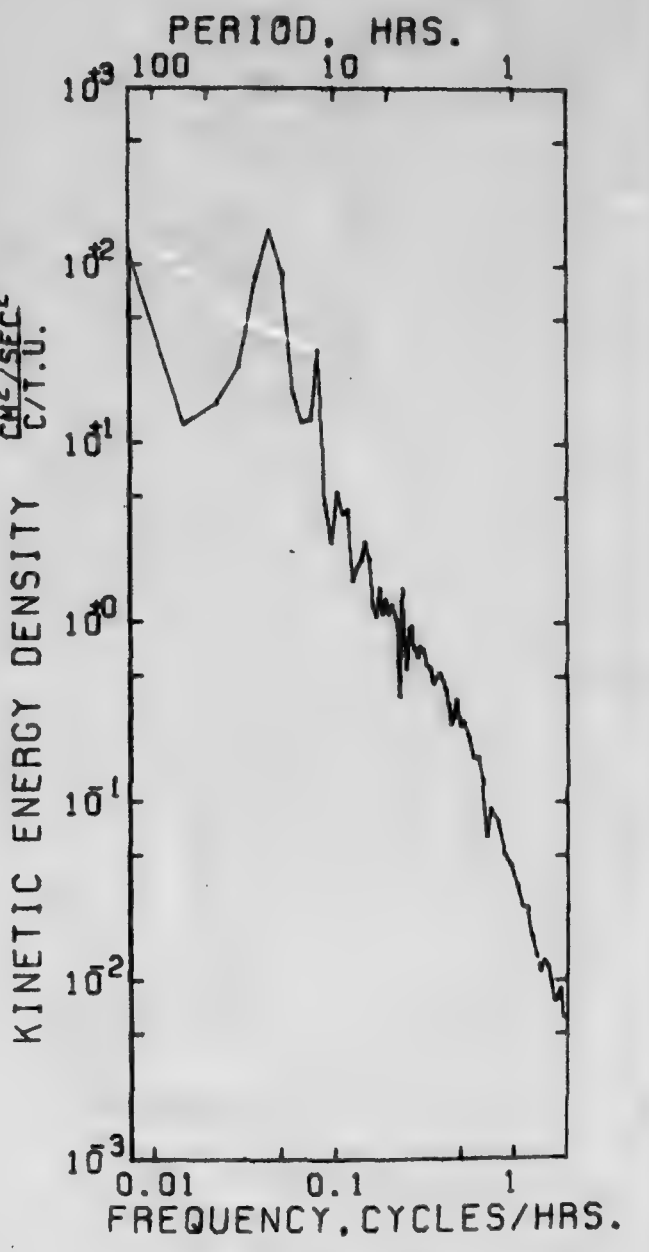
*** TEMPERATURE ***
*** DEGREES C. ***

MEAN =	2.950	STD ERR =	.001
VARIANCE =	.003		
STD. DEV. =	.054		
KURTOSIS =	1.776		
SKEWNESS =	-.271		

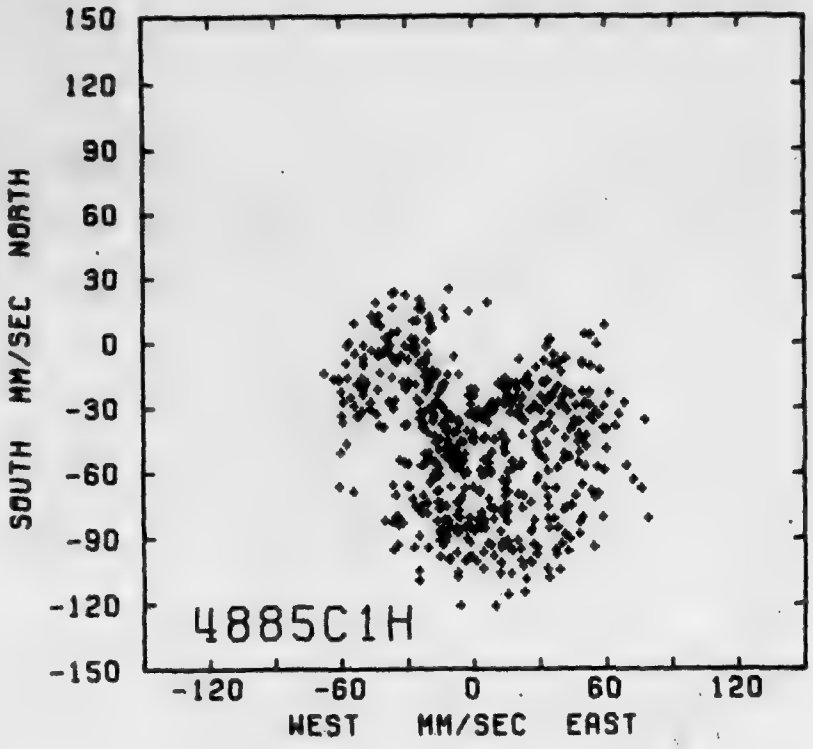
SAMPLE SIZE = 2204 POINTS

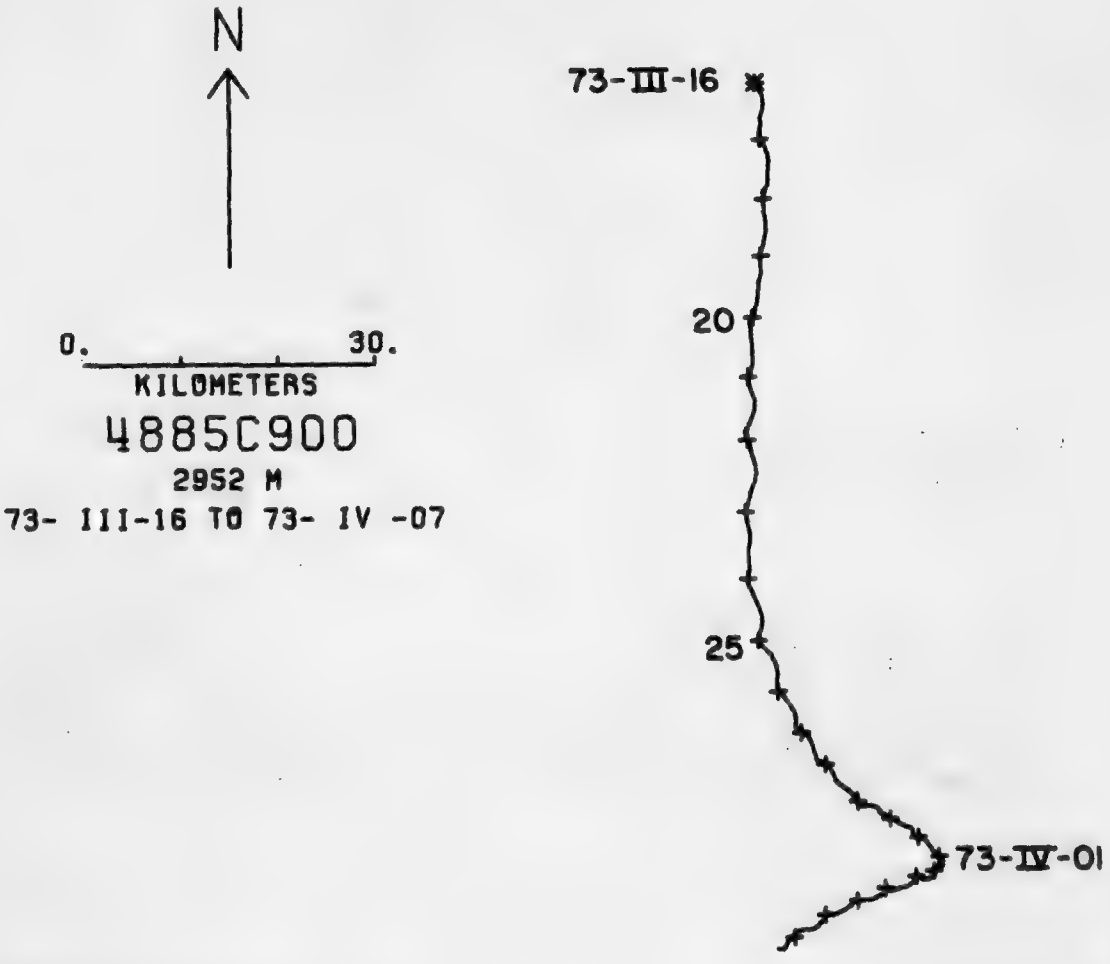


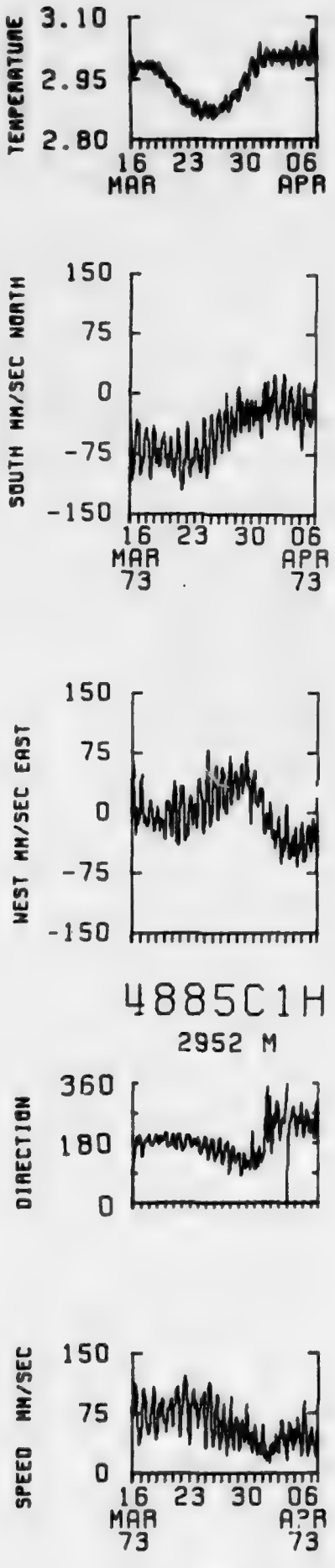
AUTO SPECTRUM
4885C900 TEMPERATURE
2952 METERS
73-III-15 TO 73-IV-06
1 PIECES WITH 1080 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
4885C900 EAST
4885C900 NORTH
2952 METERS
73-III-15 TO 73-IV-07
1 PIECES WITH 1080 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS


150
120
90
60
30
0
-30
-60
-90
-120
-150
SOUTH MM/SEC NORTH
4885C1H
-120
-60
0
60
120
WEST
MM/SEC
EAST


N
0.
30.
KILOMETERS
4885C900
2952 M
73- III-16 TO 73- IV -07
73-III-16
20
25
73-IV-01


TEMPERATURE
3.10
2.95
2.80
16
23
30
06
MAR
APR
SOUTH MM/SEC NORTH
150
75
0
-75
-150
16
23
30
06
MAR
73
APR
73
WEST MM/SEC EAST
150
75
0
-75
-150
4885C1H
2952 M
DIRECTION
360
180
0
SPEED MM/SEC
150
75
0
16
23
30
06
MAR
73
APR
73

Mooring No. 489

Set 1973 Mar 16 (Year Month Day) 29° 35.0'N (Latitude) 69° 59.1'W (Longitude)

Set by J. Gifford - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 1

Retrieved 1973 June 30 (Year Month Day)

Retrieved by G. Tupper - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 6

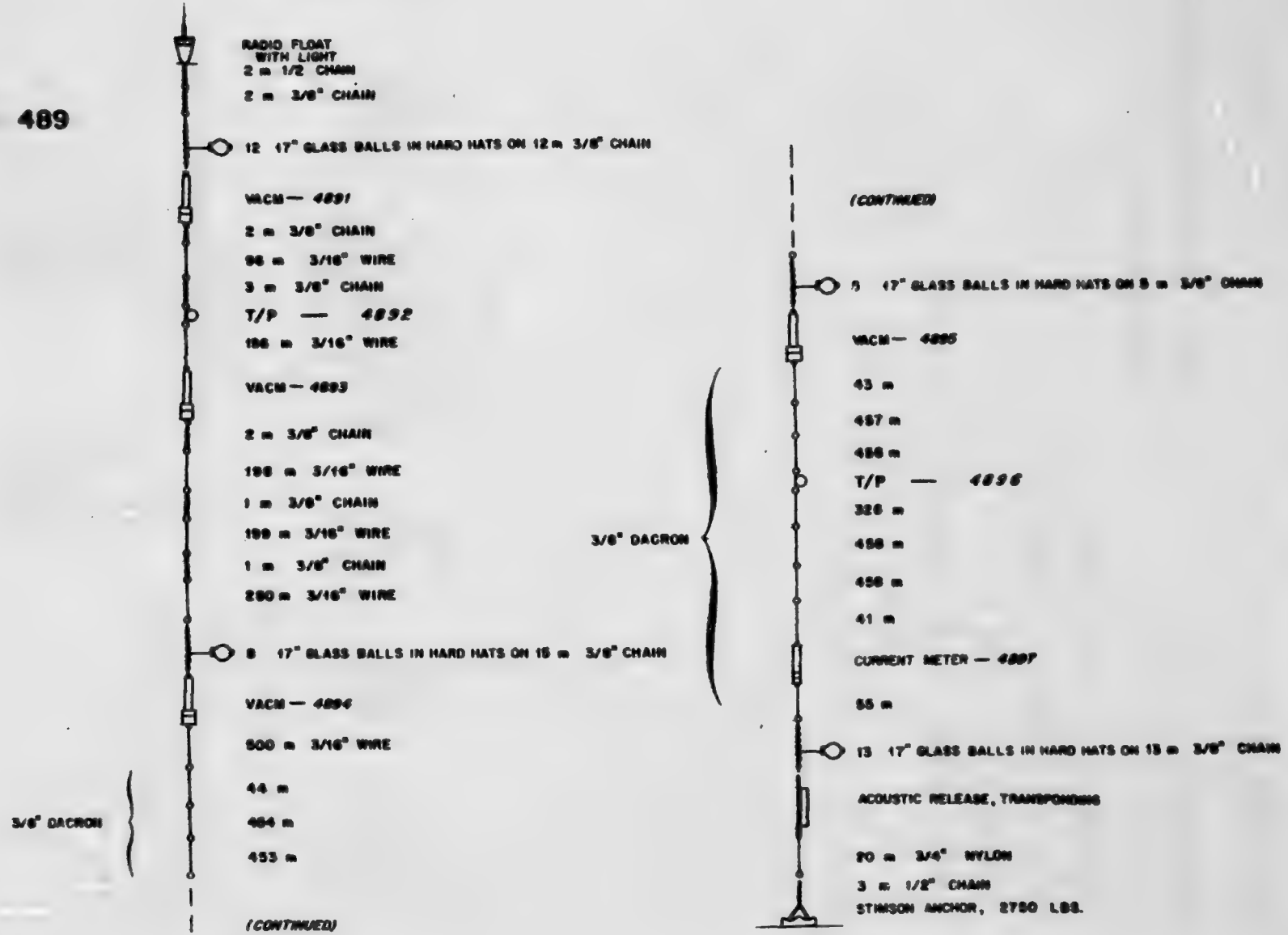
Purpose of Mooring: Mooring #14 of MODE 1 array

Mooring Type: Subsurface

Key	Data Number	Instrument Number	Type	Depth Meters	Comments
+	4891	V-0141	VACM	404	
#	4892	#42	T/P	507	M.I.T.
+	4893	V-0174	VACM	707	U.R.I.
*	4894	V-0111	VACM	1414	
*	4895	V-0179	VACM	2936	
#	4896	#21	T/P	3959	M.I.T.
	4897	N-337	Film	5339	Navy (film recording CM)
	Water depth			5440	

COMMENTS ON MOORING:

STATION 489


RADIO FLOAT WITH LIGHT
2 m 1/2 CHAIN
2 m 3/8" CHAIN
12 17" GLASS BALLS IN HARD HATS ON 12 m 3/8" CHAIN
VACM — 4891
2 m 3/8" CHAIN
96 m 3/16" WIRE
3 m 3/8" CHAIN
T/P — 4892
196 m 3/16" WIRE
VACM — 4893
2 m 3/8" CHAIN
196 m 3/16" WIRE
1 m 3/8" CHAIN
199 m 3/16" WIRE
1 m 3/8" CHAIN
280 m 3/16" WIRE
8 17" GLASS BALLS IN HARD HATS ON 15 m 3/8" CHAIN
VACM — 4894
500 m 3/16" WIRE
3/8" DACRON
44 m
464 m
453 m
(CONTINUED)
(CONTINUED)
5 17" GLASS BALLS IN HARD HATS ON 5 m 3/8" CHAIN
VACM — 4895
3/8" DACRON
43 m
457 m
456 m
T/P — 4896
326 m
456 m
456 m
41 m
CURRENT METER — 4897
55 m
13 17" GLASS BALLS IN HARD HATS ON 13 m 3/8" CHAIN
ACOUSTIC RELEASE, TRANSPONDER
20 m 3/4" NYLON
3 m 1/2" CHAIN
STIMSON ANCHOR, 2750 LBS.

DATA NUMBER 4894

Instrument No.: V-0111 Type: Vector Averaging Current Meter

Depth: 1414 m Water Depth: 5440 m

Start time: 73-March-16 09.22.30.

Stop time: 73-April-04 16.52.30.

Duration: 19d 7h 30m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

Compass - good

Vane - stuck from April 4 to recovery

Rotor - good

Temperature - good

STATS DATA/ 4894C0008

	EAST	NORTH	SPEED	##### EAST & NORTH	#####
MEAN =	-18.82	-3.25	43.61	COVARIANCE =	-149.64
STD. ERR. =	.81	.87	.42	STD. ERR. OF COVARIANCE =	21.19
VARIANCE =	1223.84	800.80	325.84	STD. DEV. OF COVARIANCE =	810.07
STD. DEV. =	34.88	24.51	18.05	CORRELATION COEFFICIENT =	-.174
KURTOSIS =	1.78	2.56	2.15	VECTOR MEAN =	20.08
SKEWNESS =	.08	.14	.41	VECTOR VARIANCE =	812.37
				STD. DEV. =	30.21

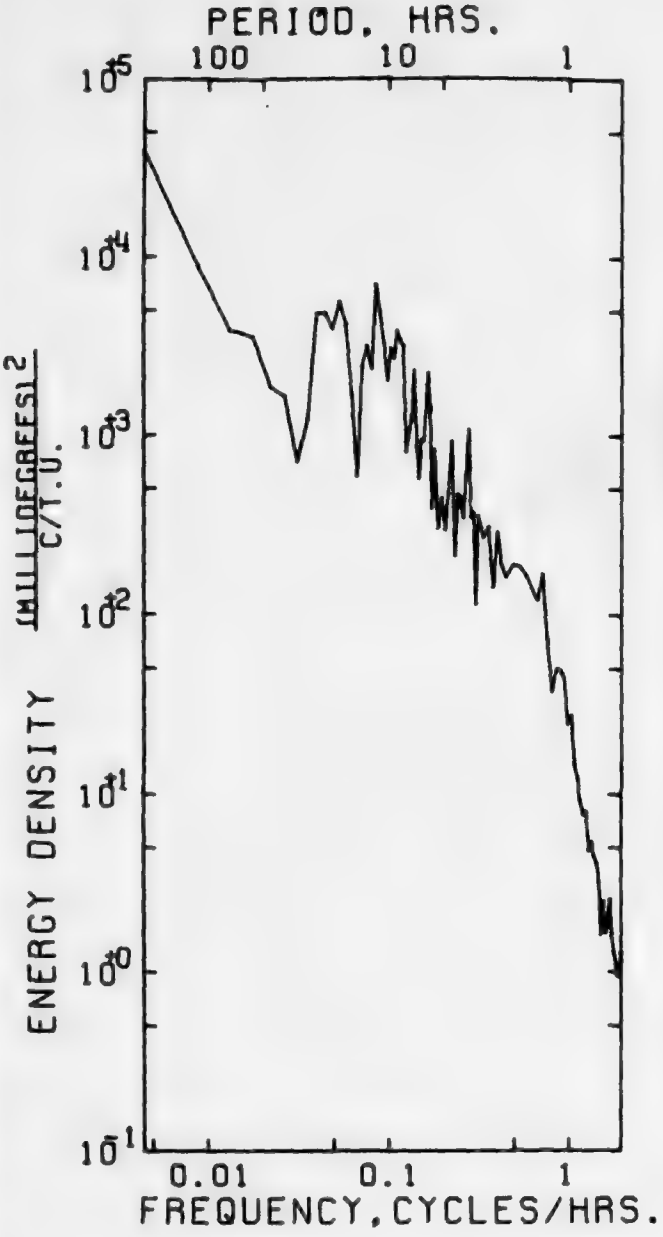
UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 1855 POINTS

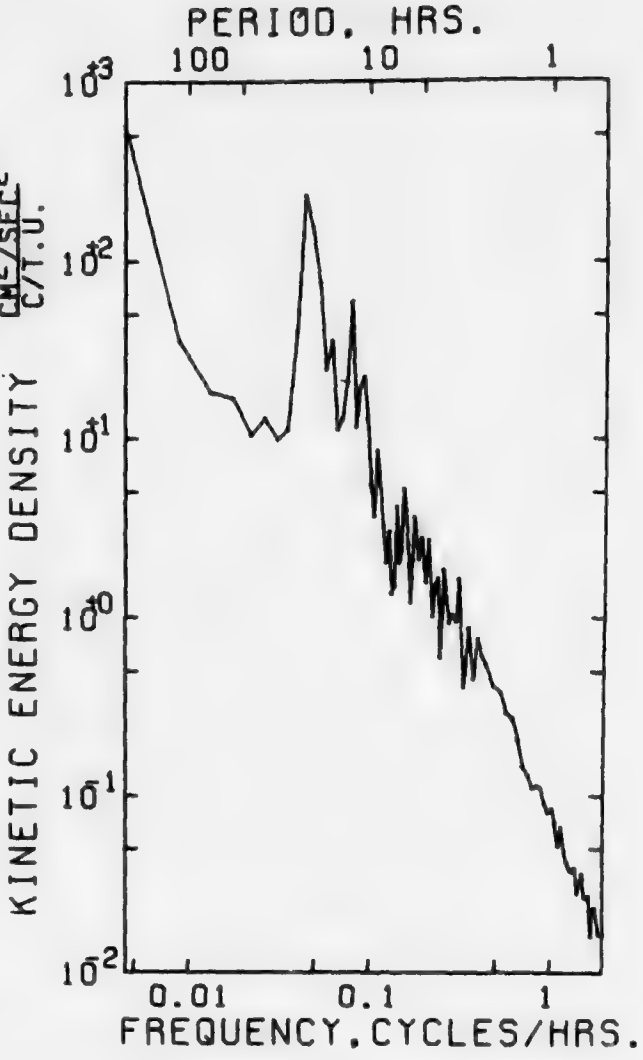
SPANNING RANGE
FROM 73- III-16 09.22.30
TO 73- IV -04 16.52.30

DURATION 18 DAYS 7 H 30 M

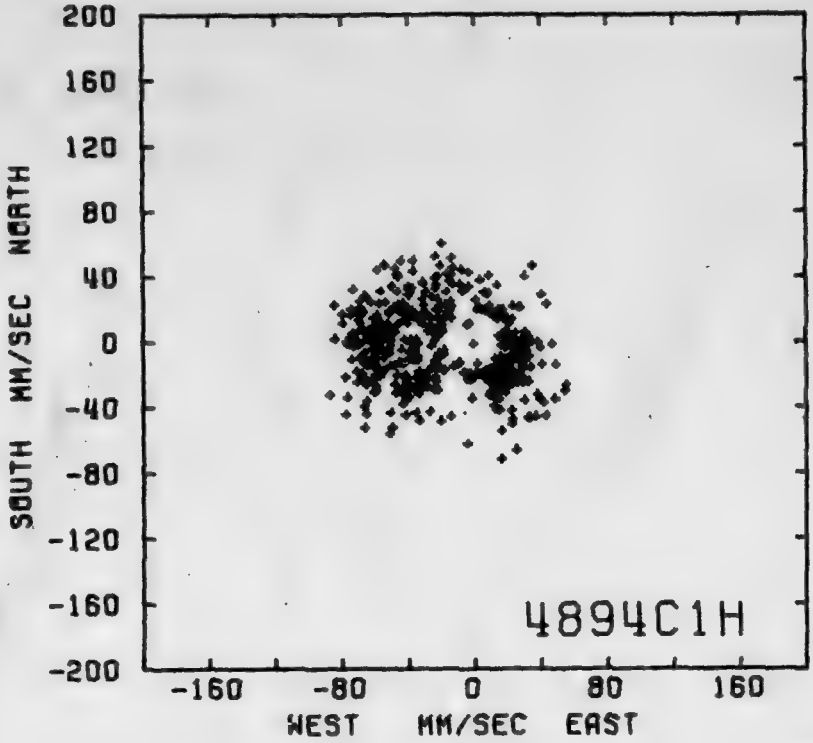
VARIABLE = TEMPERATURE	
UNITS = DEGREES C.	
MEAN =	4.572
STD. ERR. =	.888E-3
VARIANCE =	.878E-3
STD. DEV. =	.296E-1
KURTOSIS =	2.588
SKEWNESS =	-.709E-1
MINIMUM =	4.483
MAXIMUM =	4.881



AUTO SPECTRUM
4894C900 TEMPERATURE
1414 METERS
73-III-16 TO 73-IV-03
1 PIECES WITH 900 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS



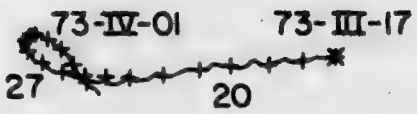
AUTO SPECTRUM
4894C900 EAST
4894C900 NORTH
1414 METERS
73-III-16 TO 73-IV-04
1 PIECES WITH 900 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS

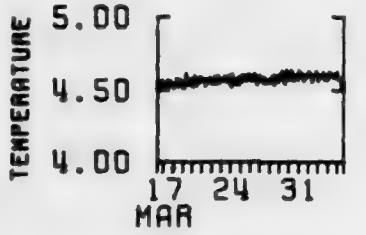


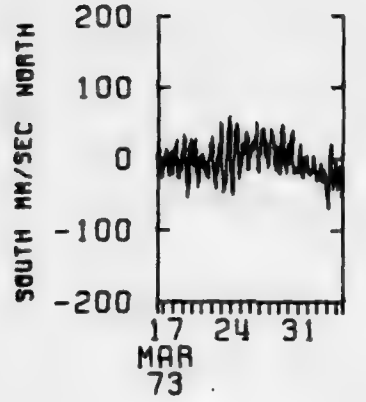
4894C900

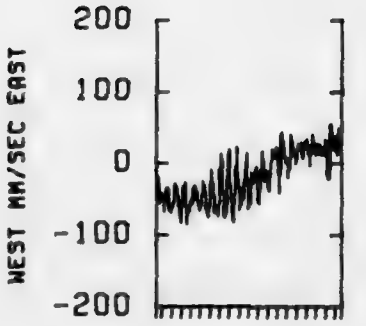
1414 M

73- III-17 TO 73- IV -04



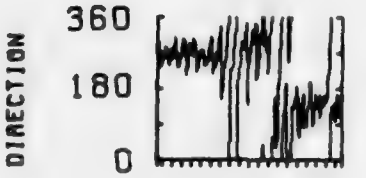


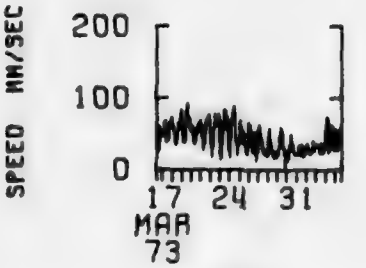




4894C1H

1414 M





DATA NUMBER 4895

Instrument No.: V-0179 Type: Vector Averaging Current Meter

Depth: 2936 m Water Depth: 5440 m

Start time: 73-March-16 16.07.30.

Stop time: 73-April-28 03.52.30.

Duration: 42d 11h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

Compass - good

Vane - sticky April 28 to May 5, stuck May 5 to recovery

Rotor - May 6 to May 19 rotor low, suspicious. May 19 to recovery rotor below threshold

Temperature - good

STATS DATA/ 4895S900R

	EAST	NORTH	SPEED	###### EAST & NORTH	######
MEAN =	1.63	-6.76	39.89	COVARIANCE =	-74.94
STD. ERR. =	.52	.40	.23	STD. ERR. OF COVARIANCE =	10.58
VARIANCE =	1088.73	858.09	218.47	STD. DEV. OF COVARIANCE =	678.50
STD. DEV. =	33.12	25.85	14.71	CORRELATION COEFFICIENT =	-.088
KURTOSIS =	2.80	2.04	3.68	VECTOR MEAN =	8.05
SKEWNESS =	-.50	.09	.92	VECTOR VARIANCE =	877.41
				STD. DEV. =	29.62

UNITS OF RAW DATA VARIABLES = CM/SEC

SAMPLE SIZE = 4080 POINTS

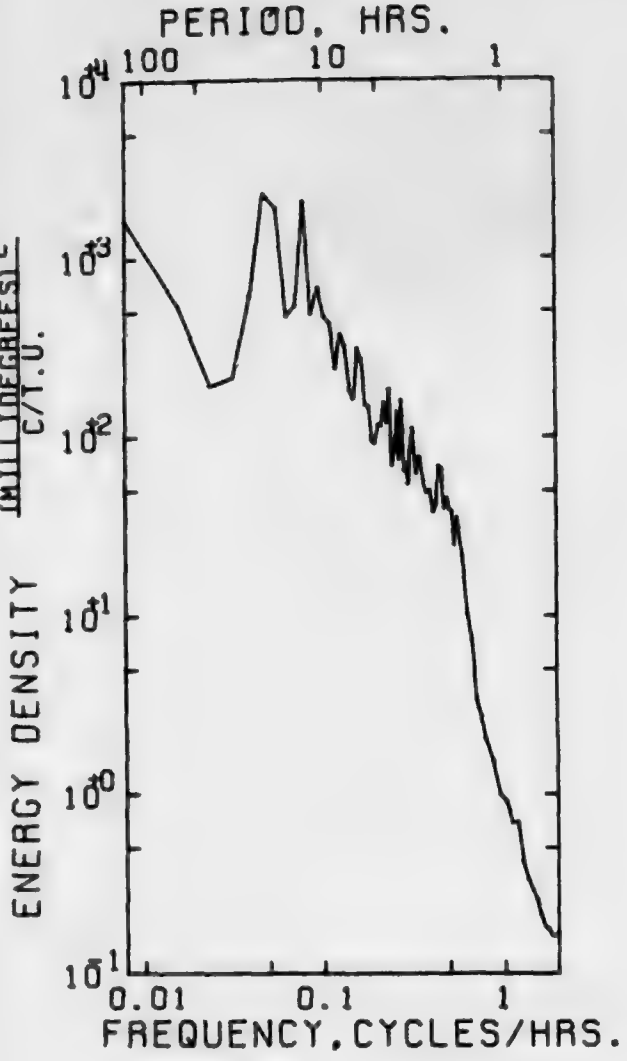
SPANNING RANGE
FROM 73- III-16 16.07.30
TO 73- IV -28 03.52.30

DURATION 42 DAYS 11 H 45 M

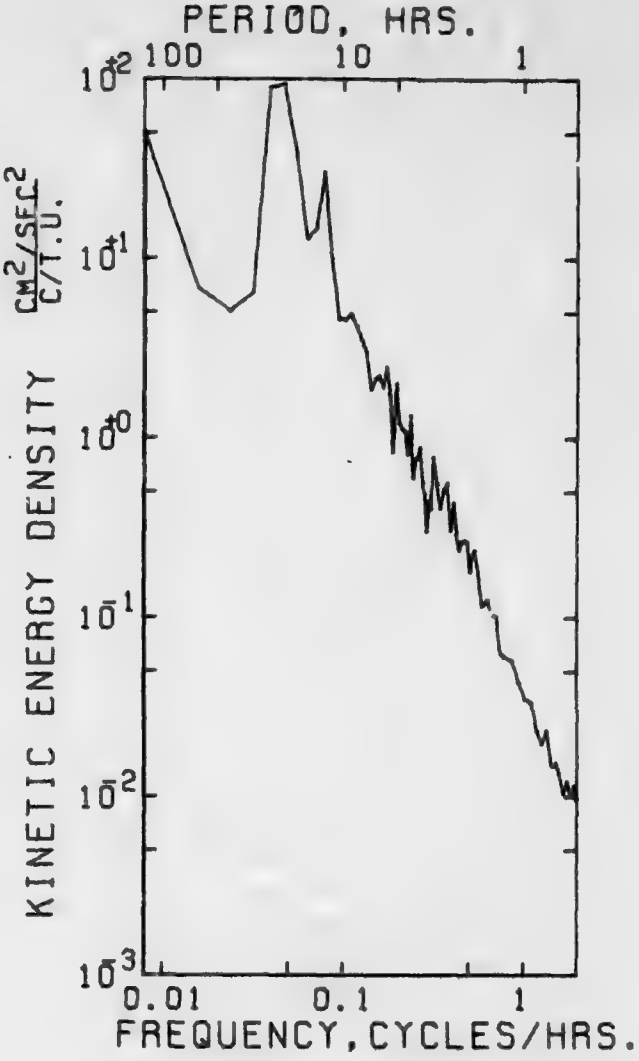
*** TEMPERATURE ***
*** DEGREES C. ***

MEAN =	2.780	STD ERR =	.000
VARIANCE =	.000		
STD. DEV. =	.017		
KURTOSIS =	3.205		
SKEWNESS =	-.480		

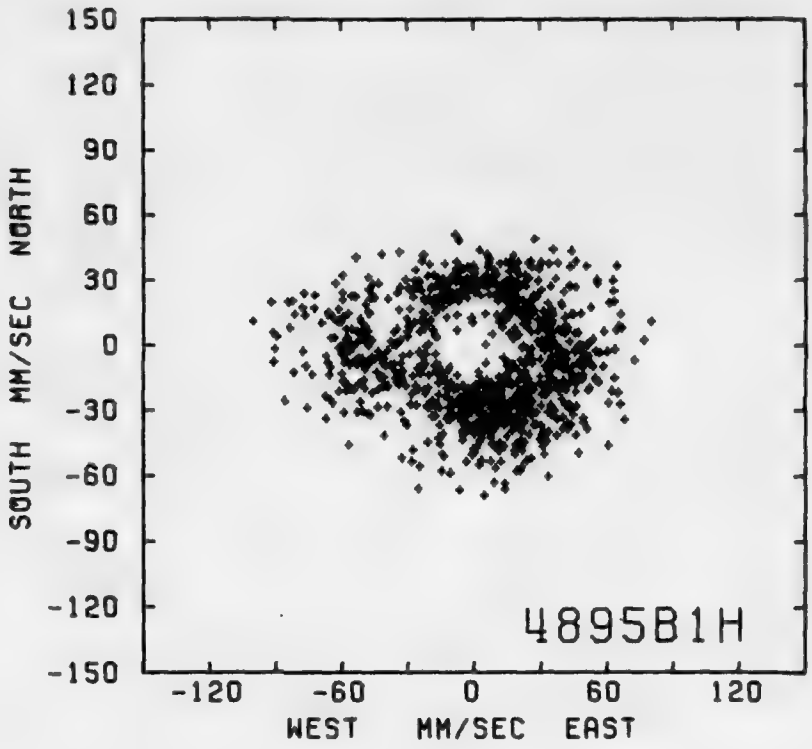
SAMPLE SIZE = 4080 POINTS



AUTO SPECTRUM
48958900 TEMPERATURE
2936 METERS
73-III-16 TO 73-IV-27
1 PIECES WITH 2025 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS



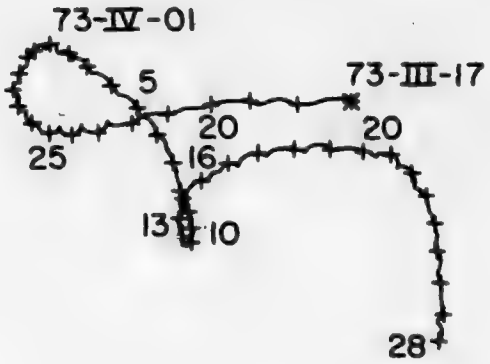
AUTO SPECTRUM
4895B900 EAST COMP
4895B900 NORTH COMP
2936 METERS
73-III-16 TO 73-IV-27
1 PIECES WITH 2025 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS

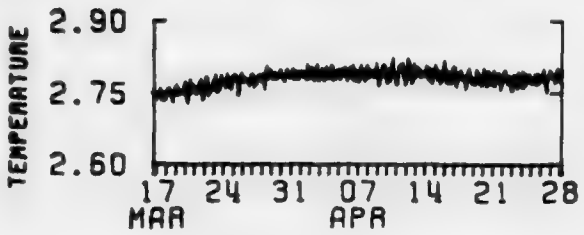


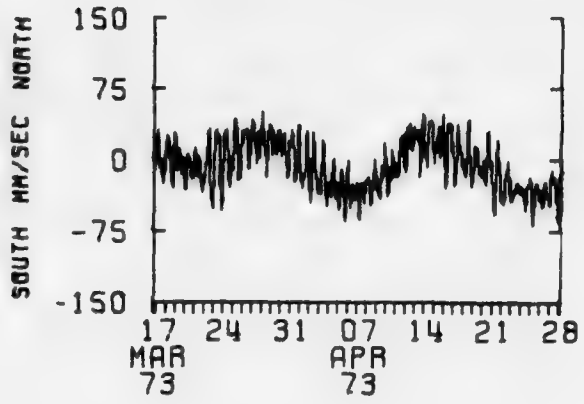
4895B900

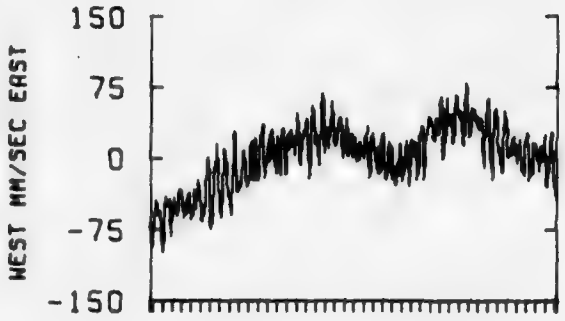
2936 M

73- III-17 TO 73- IV -28



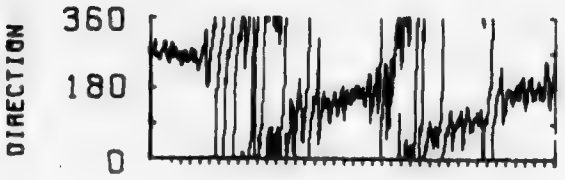


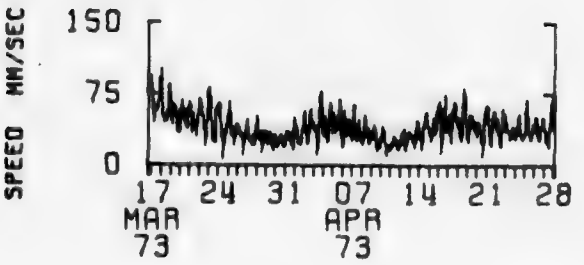




4895B1H

2936 M





Mooring No. 493

Set 1973 Mar 31 (Year Month Day) 28° 42.0'N (Latitude) 70° 15.8'W (Longitude)

Set by G. Tupper - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 2

Retrieved 1973 June 30 (Year Month Day)

Retrieved by G. Tupper - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 6

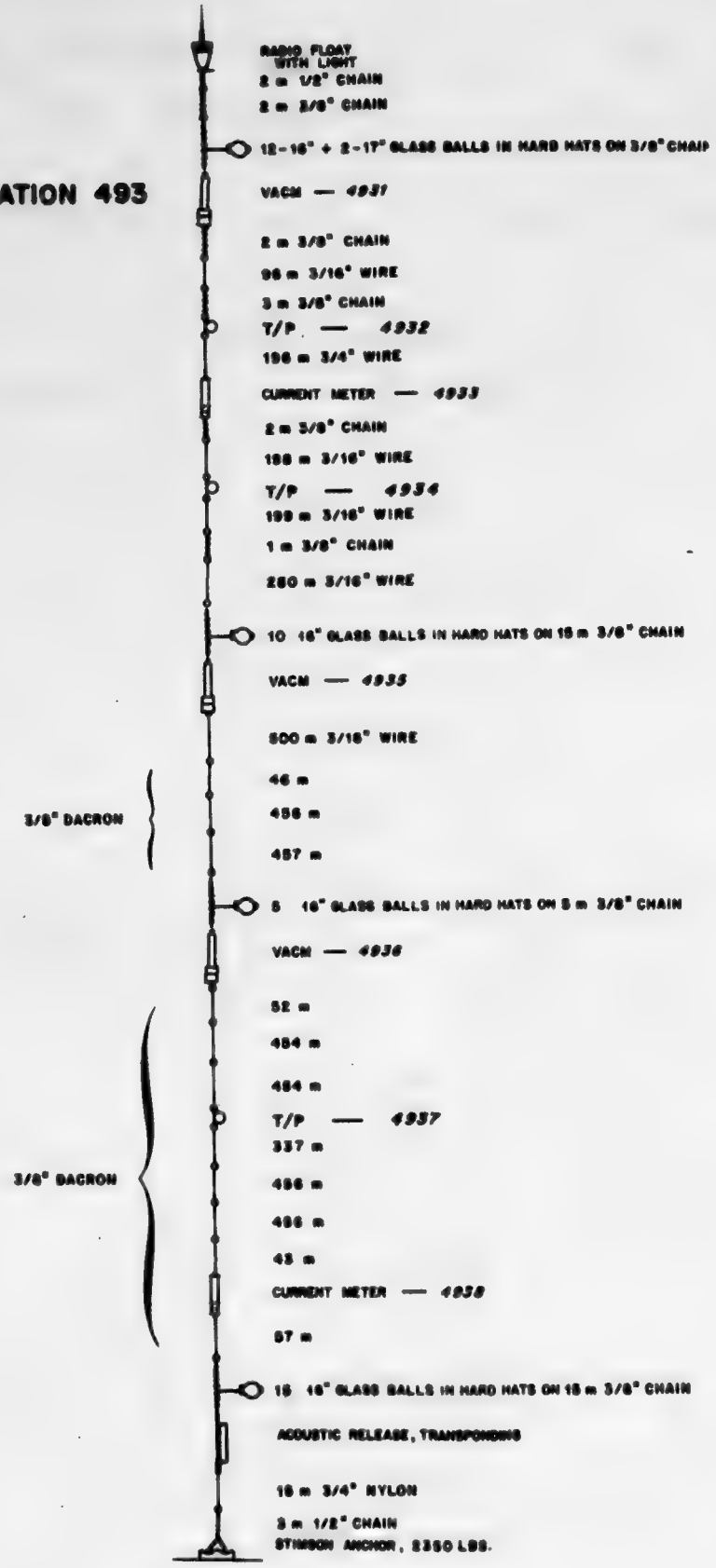
Purpose of Mooring: Mooring #6 of MODE 1 array

Mooring Type: Subsurface

Key	Data Number	Instrument Number	Type	Depth Meters	Comments
*	4931	V-0199	VACM	408	
#	4932	#34	T/P	512	M.I.T.
*	4933	M-142t	850	709	
#	4934	#52	T/P	908	M.I.T.
*	4935	V-0195	VACM	1410	
*	4936	V-0138	VACM	2933	
#	4937	#25	T/P	3957	M.I.T.
	4938	M-179	850	5347	U.R.I.
	Water depth			5446	

COMMENTS ON MOORING:

STATION 493


RADIO FLOAT WITH LIGHT
2 m 1/2" CHAIN
2 m 3/8" CHAIN
12-16" + 2-17" GLASS BALLS IN HARD HATS ON 3/8" CHAIN
VACM — 4931
2 m 3/8" CHAIN
98 m 3/16" WIRE
3 m 3/8" CHAIN
T/P — 4932
196 m 3/4" WIRE
CURRENT METER — 4933
2 m 3/8" CHAIN
198 m 3/16" WIRE
T/P — 4934
199 m 3/16" WIRE
1 m 3/8" CHAIN
250 m 3/16" WIRE
10 16" GLASS BALLS IN HARD HATS ON 15 m 3/8" CHAIN
VACM — 4935
500 m 3/16" WIRE
46 m
456 m
457 m
3/8" DACRON
5 16" GLASS BALLS IN HARD HATS ON 5 m 3/8" CHAIN
VACM — 4936
52 m
484 m
484 m
T/P — 4937
337 m
486 m
486 m
45 m
CURRENT METER — 4938
57 m
3/8" DACRON
15 16" GLASS BALLS IN HARD HATS ON 15 m 3/8" CHAIN
ACOUSTIC RELEASE, TRANSPONDING
15 m 3/4" NYLON
3 m 1/2" CHAIN
STIMSON ANCHOR, 2350 LBS.

DATA NUMBER 4931

Instrument No.: V-0199 Type: Vector Averaging Current Meter

Depth: 408 m Water Depth: 5446 m

Start time: 73-April-01 09.07.30.

Stop time: 73-May-11 23.52.30.

Duration: 40d 18h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

Compass - good

Vane - good

Rotor - threshold problems May 12 to end

Temperature - good

STATS DATA/ 49318800A

	EAST	NORTH	SPEED
MEAN	84.24	141.85	174.62
STD. ERR.	.76	1.23	1.11
VARIANCE	2251.45	5888.81	4883.44
STD. DEV.	47.45	76.73	69.74
KURTOSIS	2.52	1.88	2.00
SKEWNESS	-.09	.11	-.00

***** EAST & NORTH *****	
COVARIANCE	168.83
STD. ERR. OF COVARIANCE	163.11
STD. DEV. OF COVARIANCE	10206.93
CORRELATION COEFFICIENT	.046
VECTOR MEAN	164.88
VECTOR VARIANCE	4068.13
STD. DEV.	63.78

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 3916 POINTS

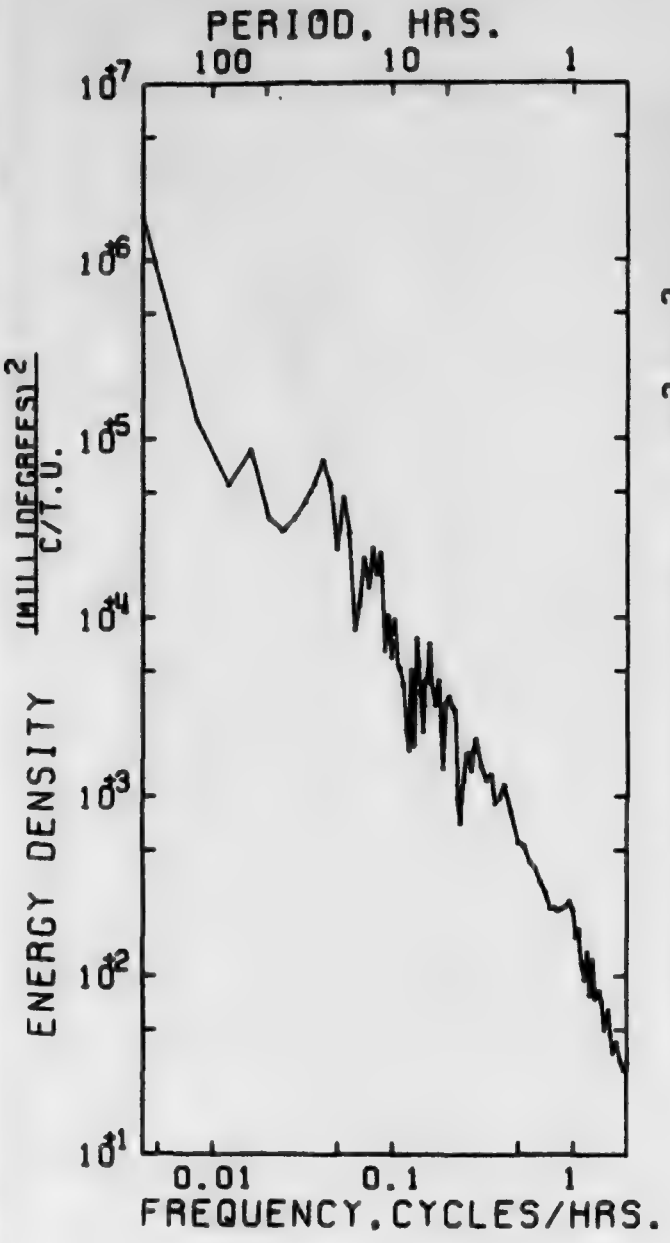
SPANNING RANGE
FROM 73- IV -01 05.07.30
TO 73- V -11 23.52.30

DURATION 40 DAYS 18 H 45 M

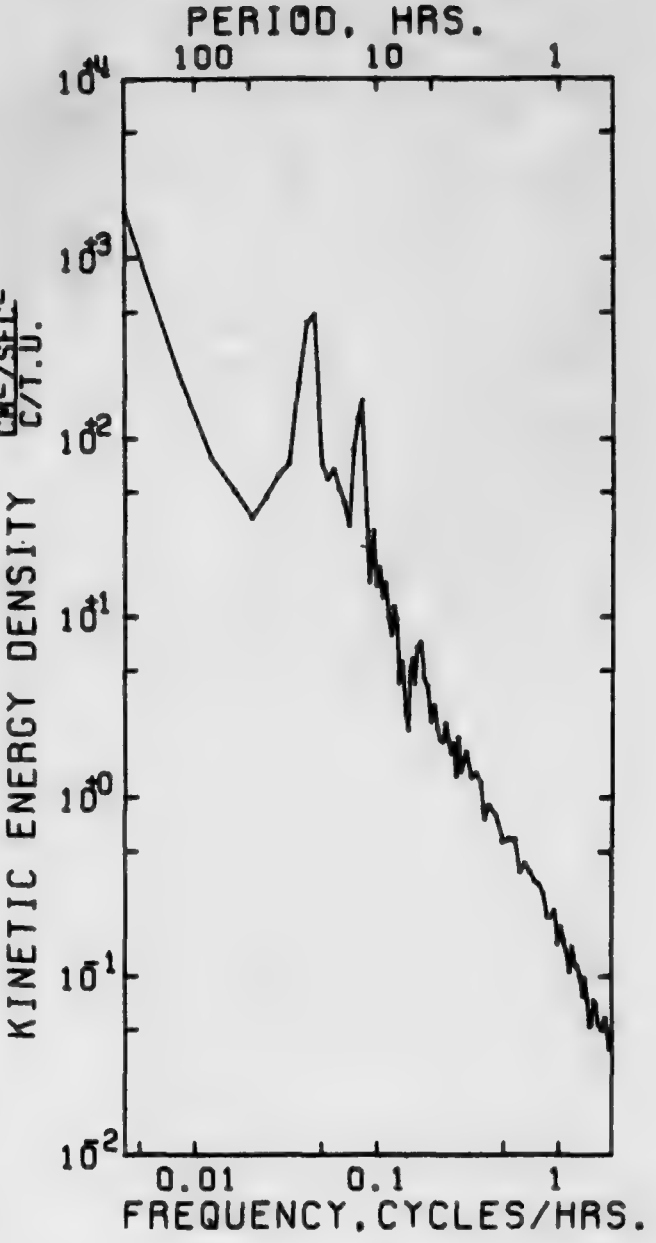
*** TEMPERATURE ***
*** DEGREES C. ***

MEAN	=	17.122	STD ERR = .00?
VARIANCE	=	.021	
STD. DEV.	=	.146	
KURTOSIS	=	2.622	
SKEWNESS	=	-.127	

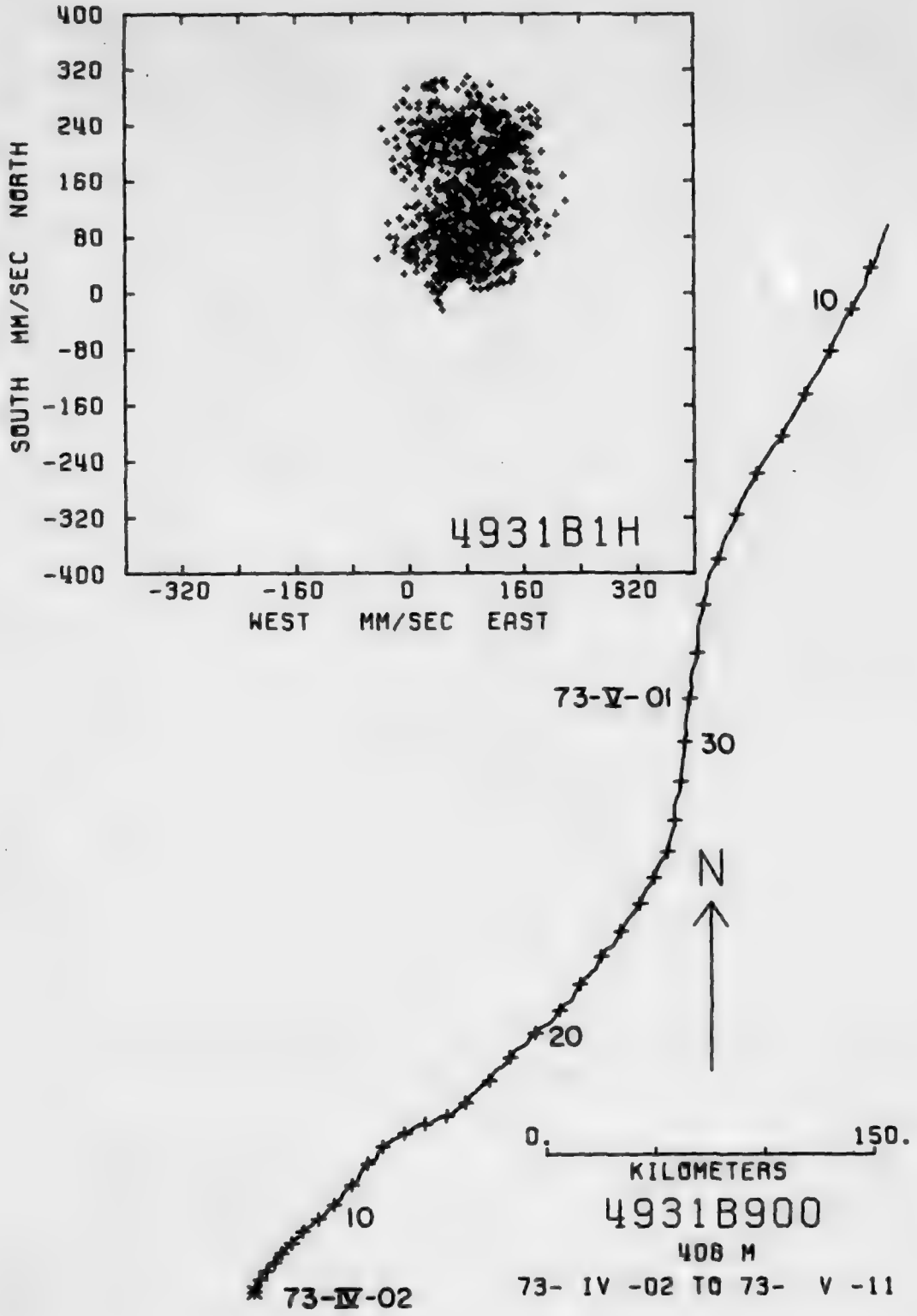
SAMPLE SIZE = 3916 POINTS

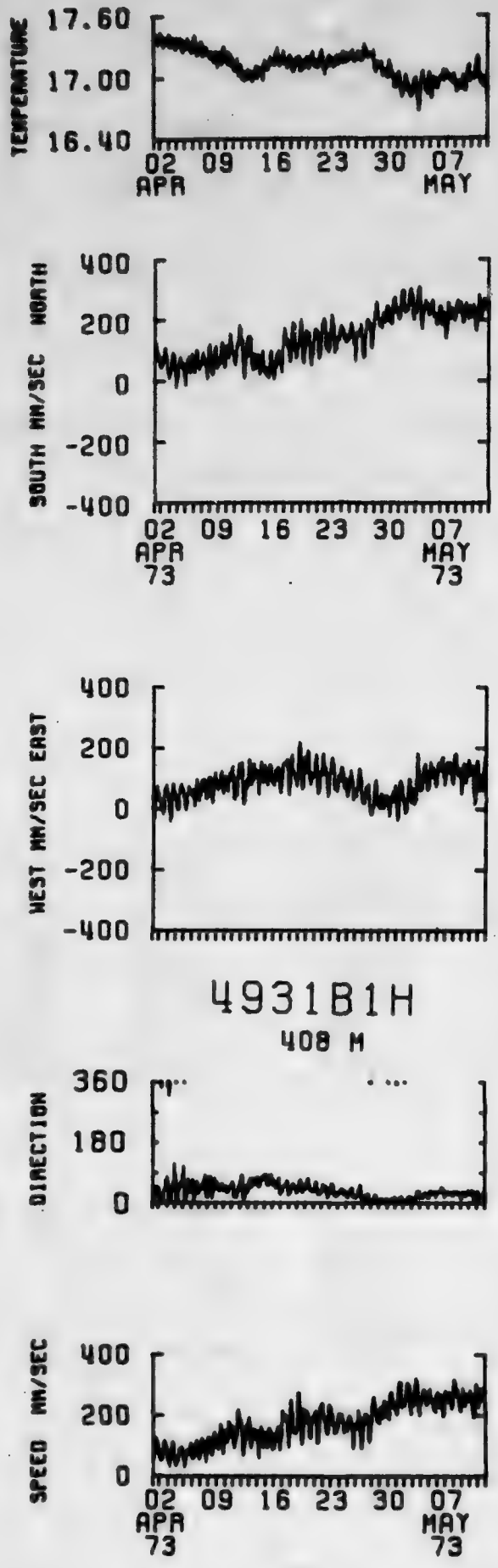


AUTO SPECTRUM
49318900 TEMPERATURE
408 METERS
73-IV-01 TO 73-V-11
1 PIECES WITH 1944 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
49318900 EAST
49318900 NORTH
408 METERS
73-IV-01 TO 73-V-11
1 PIECES WITH 1944 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS


400
320
240
160
80
0
-80
-160
-240
-320
-400
SOUTH MM/SEC NORTH
-320
-160
0
160
320
WEST
MM/SEC
EAST
4931B1H
10
73-V-01
30
N
20
10
73-IV-02
0.
150.
KILOMETERS
4931B900
408 M
73- IV -02 TO 73- V -11


TEMPERATURE
17.60
17.00
16.40
02 09 16 23 30 07
APR MAY
SOUTH MM/SEC NORTH
400
200
0
-200
-400
02 09 16 23 30 07
APR MAY
73 73
WEST MM/SEC EAST
400
200
0
-200
-400
4931B1H
408 M
DIRECTION
360
180
0
SPEED MM/SEC
400
200
0
02 09 16 23 30 07
APR MAY
73 73

DATA NUMBER 4933

Instrument No.: M-142t

Type: Magnetic Tape Recording Current Meter

Depth: 709 m

Water depth: 5446 m

Start time: 73-April-02 00.03.34

Stop time: 73-June-30 17.33.34

Duration: 89d 17h 30m

Sampling scheme: Interval

time between strobes = 5.27 seconds

no. of strobes per interval = 13

recording interval = 1800 seconds

COMMENTS:

All variables look good entire record

DATA/ 493301800

VARIABLE	EAST	NORTH	SPEED
UNITS	MM/SEC	MM/SEC	MM/SEC
MEAN	61.457	65.501	112.075
STD. ERR.	.839	.998	.809
VARIANCE	3036.065	4275.233	2817.884
STD. DEV.	55.100	65.385	53.084
KURTOSIS	2.824	2.500	2.221
SKEWNESS	-.147	.138E-1	-.303E-1
MINIMUM	-120.575	-103.102	16.000
MAXIMUM	204.005	246.881	260.000

VARIABLE	TEMPERATURE
UNITS	DEGREES C.
MEAN	11.977
STD. ERR.	.818E-2
VARIANCE	.287
STD. DEV.	.536
KURTOSIS	2.692
SKEWNESS	-.788
MINIMUM	10.217
MAXIMUM	12.845

EAST & NORTH

COVARIANCE	=	652.188
STD. ERR. OF COVARIANCE	=	86.030
STD. DEV. OF COVARIANCE	=	5848.584
CORRELATION COEFFICIENT	=	.181
VECTOR MEAN	=	89.818
VECTOR VARIANCE	=	3855.849
VECTOR STD. DEV.	=	80.462

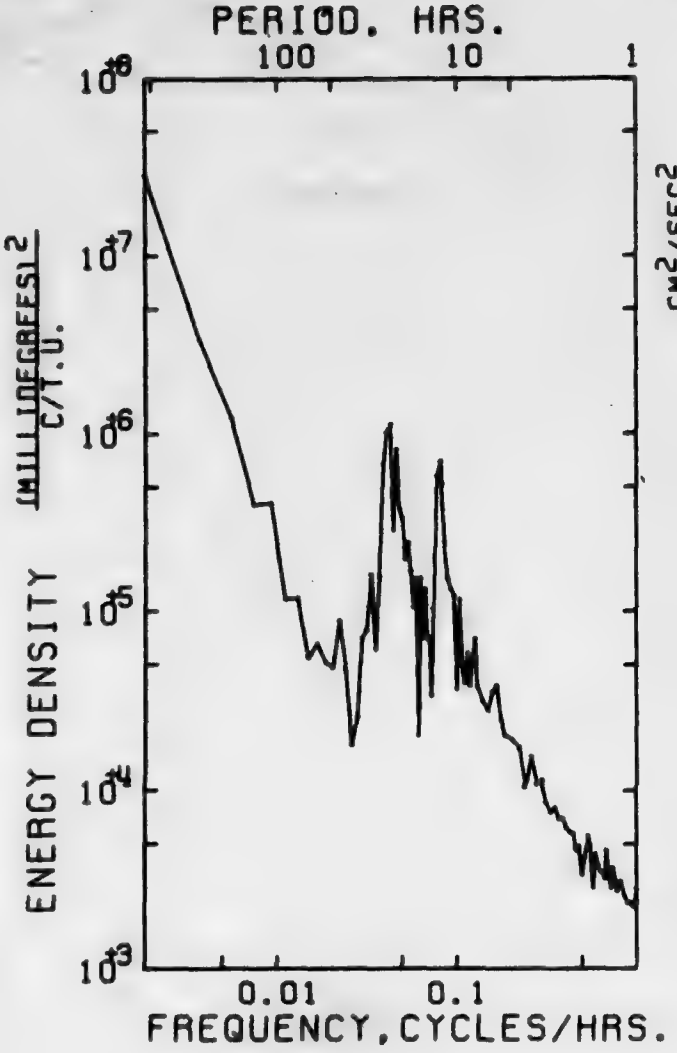
SAMPLE SIZE = 4308 POINTS

SPANNING RANGE

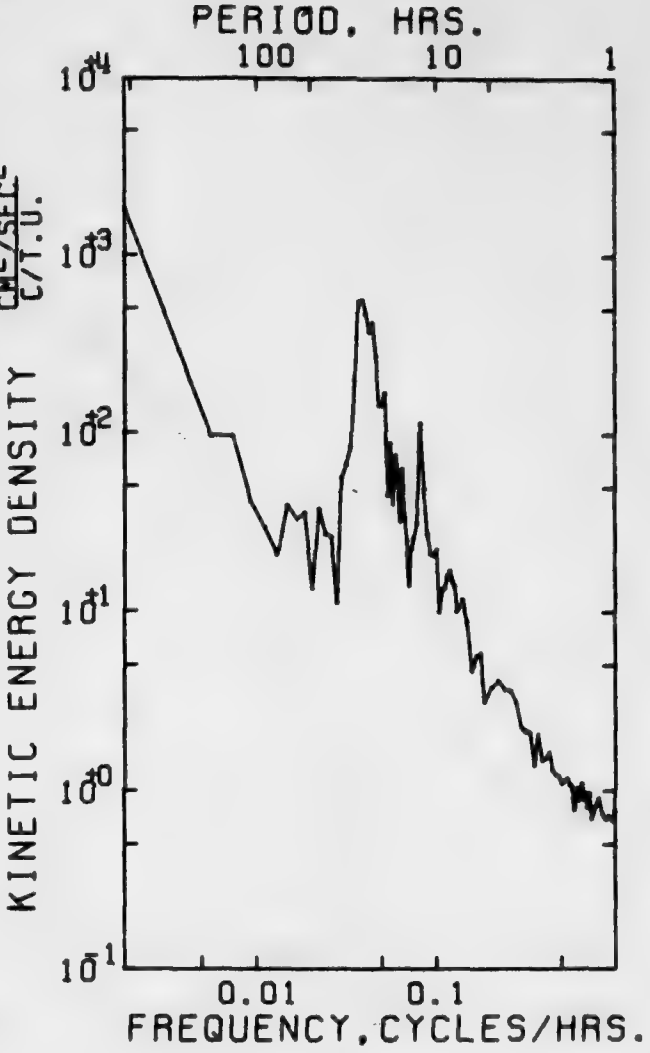
FROM 73- IV -02 00.03.34

TO 73- VI -30 17.33.34

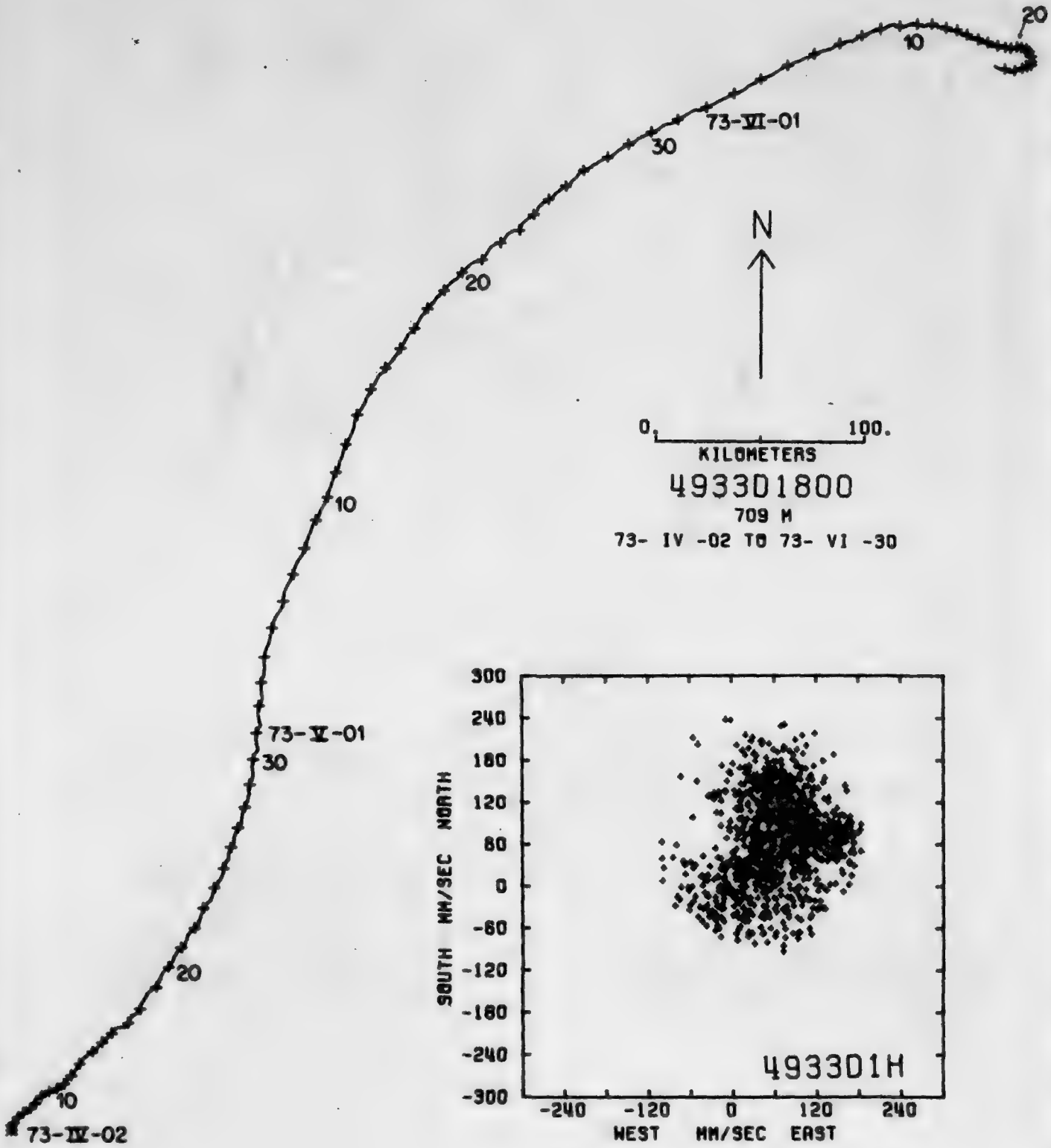
DURATION 89.73 DAYS

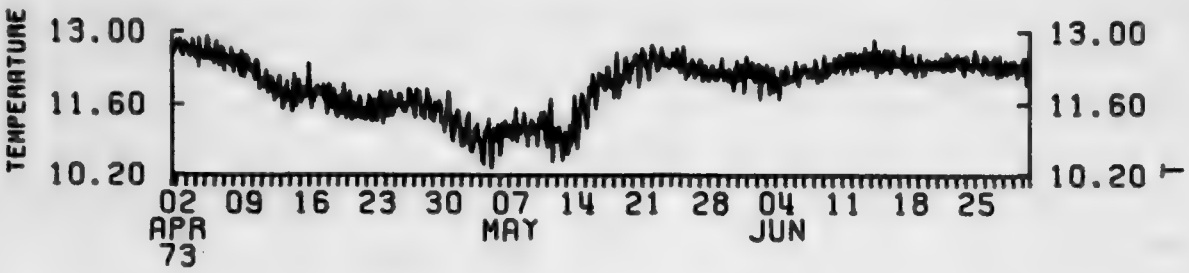


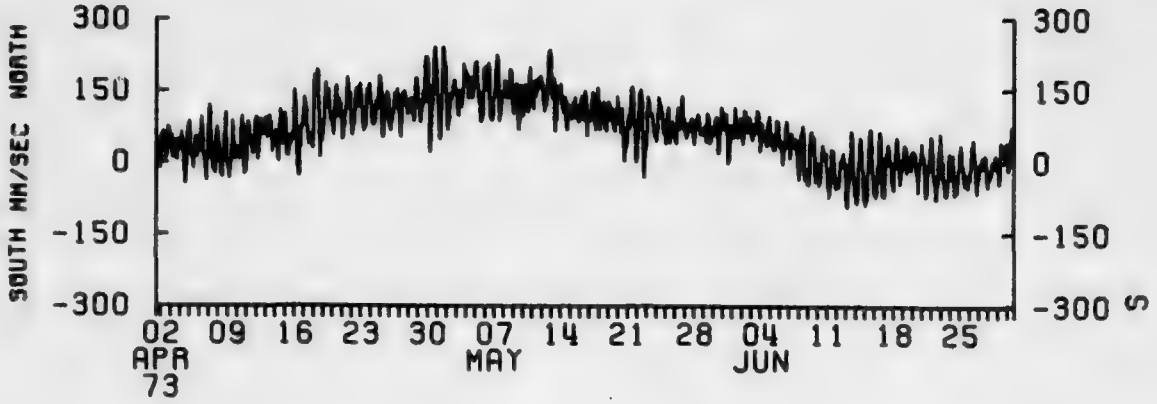
AUTO SPECTRUM
4933D1800 TEMPERATURE
791 METERS
73-IV-01 TO 73-VI-30
1 PIECES WITH 2160 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS

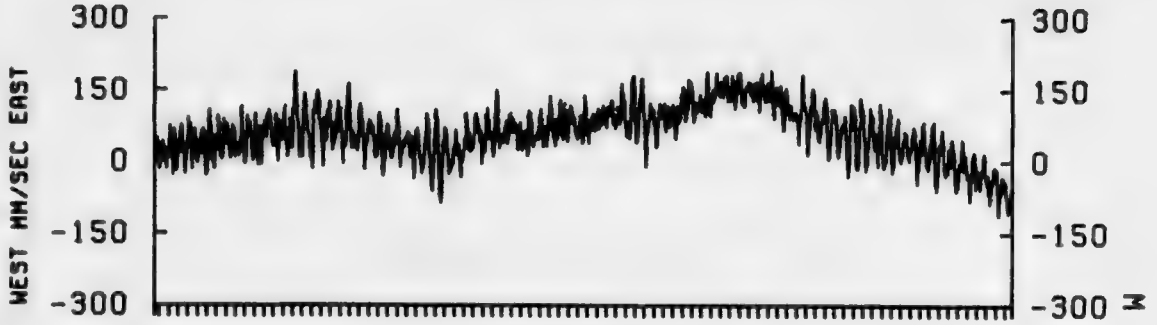


AUTO SPECTRUM
4933D1800 EAST COMP
4933D1800 NORTH COMP
791 METERS
/3-IV-01 TO 73-VI-30
1 PIECES WITH 2160 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS

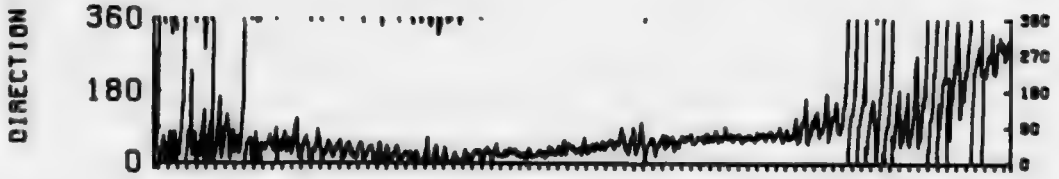

20
10
73-VI-01
30
N
20
0
100.
KILOMETERS
493D1800
709 M
73- IV -02 TO 73- VI -30
10
73-V-01
30
20
10
73-IV-02
300
240
180
120
80
0
-60
-120
-180
-240
-300
SOUTH MM/SEC NORTH
493D1H
-240
-120
0
120
240
WEST
MM/SEC
EAST

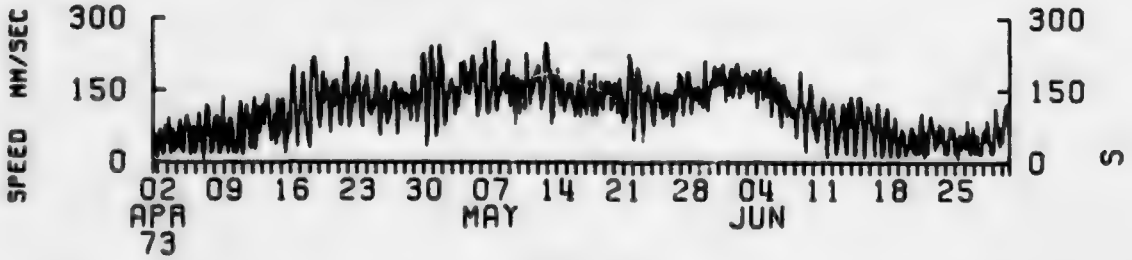

TEMPERATURE
13.00
11.60
10.20
T
02 09 16 23 30 07 14 21 28 04 11 18 25
APR
73
MAY
JUN


SOUTH MM/SEC NORTH
300
150
0
-150
-300
S
02 09 16 23 30 07 14 21 28 04 11 18 25
APR
73
MAY
JUN


WEST MM/SEC EAST
300
150
0
-150
-300
W

4933D1H


DIRECTION
360
180
0


SPEED MM/SEC
300
150
0
S
02 09 16 23 30 07 14 21 28 04 11 18 25
APR
73
MAY
JUN

DATA NUMBER 4935

Instrument No.: V-0195 Type: Vector Averaging Current Meter

Depth: 1410 m Water Depth: 5446 m

Start time: 73-April-21 00.07.30.

Stop time: 73-May-13 23.52.30.

Duration: 22d 23h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

Compass - good

Vane - stuck May 14 to recovery

Rotor - at threshold April 10 to April 20

Temperature - good

STATS DATA/ 49358900B

	EAST	NORTH	SPEED	***** EAST & NORTH	*****
MEAN =	4.11	28.00	49.49	* COVARIANCE =	66.58
STD. ERR. =	.71	.69	.48	* STD. ERR. OF COVARIANCE =	29.04
VARIANCE =	1118.11	1045.51	513.63	* STD. DEV. OF COVARIANCE =	1384.13
STD. DEV. =	33.41	32.33	22.66	* CORRELATION COEFFICIENT =	.062
KURTOSIS =	2.88	2.98	3.02	* VECTOR MEAN =	28.30
SKEWNESS =	-.13	-.00	.70	* VECTOR VARIANCE =	1080.81
				* STD. DEV. =	32.88

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 2208 POINTS

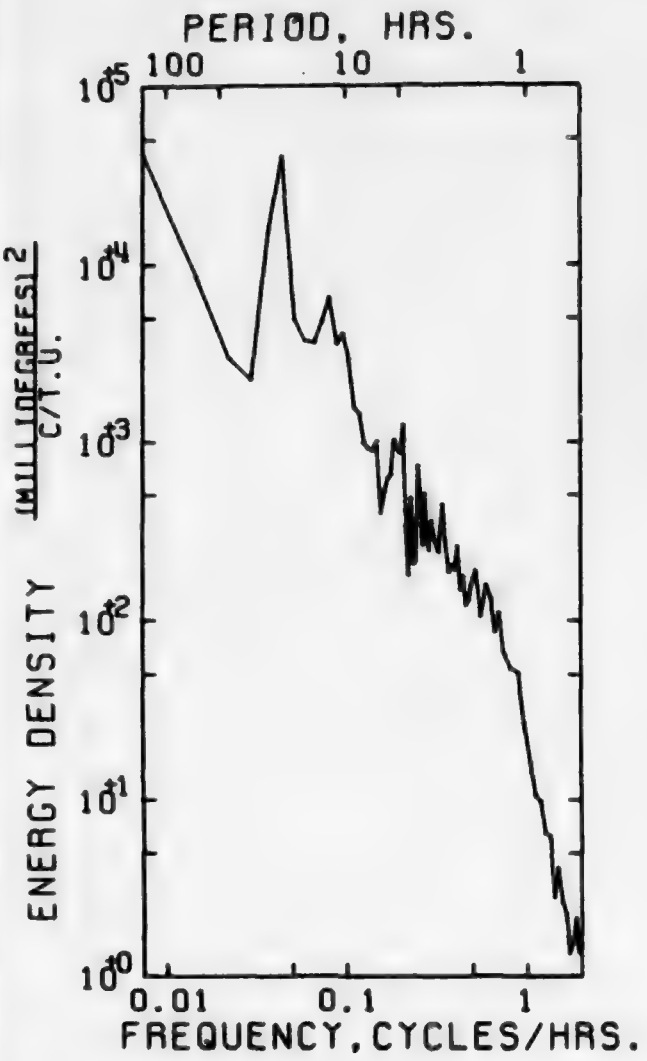
SPANNING RANGE
FROM 73- IV -21 00.07.30
TO 73- V -13 23.52.30

DURATION 22 DAYS 23 H 45 M

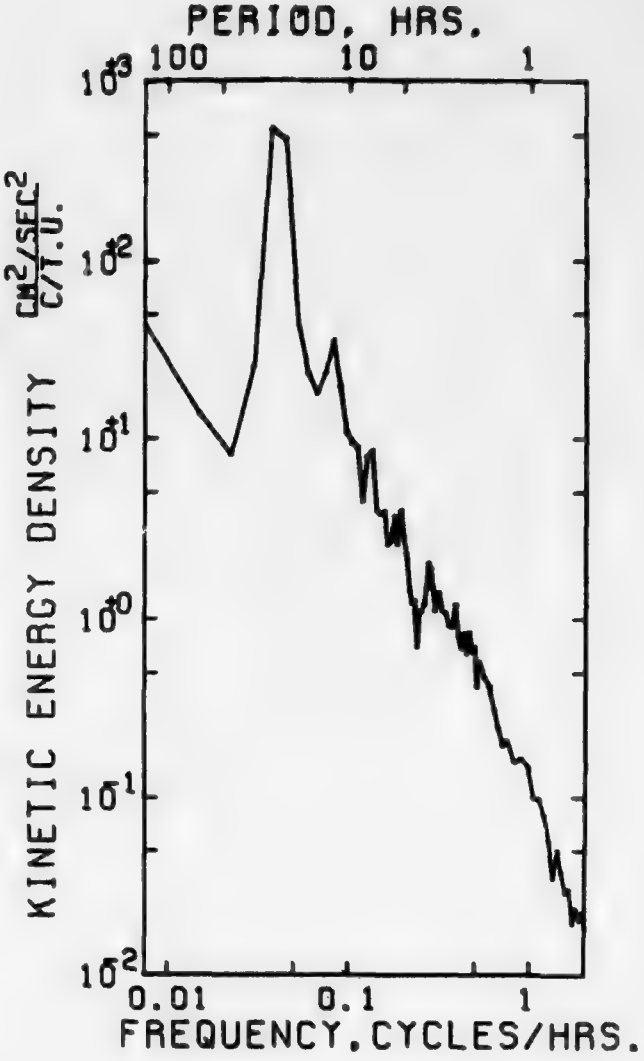
*** TEMPERATURE ***
*** DEGREES C. ***

MEAN =	4.432	STD ERR =	.001
VARIANCE =	.001		
STD. DEV. =	.038		
KURTOSIS =	2.936		
SKEWNESS =	-.176		

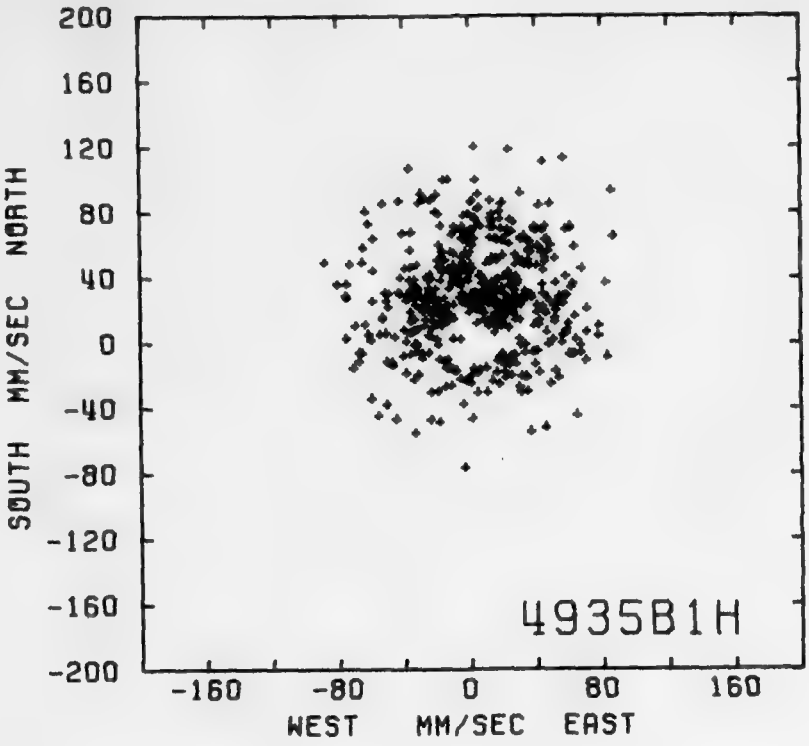
SAMPLE SIZE = 2208 POINTS



AUTO SPECTRUM
49358900 TEMPERATURE
1410 METERS
73-IV-21 TO 73-V-13
1 PIECES WITH 1080 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS



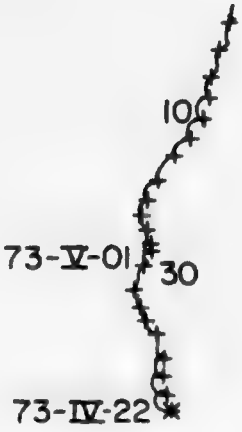
AUTO SPECTRUM
49358900 EAST
49358900 NORTH
1410 METERS
73-IV-21 TO 73-V-13
1 PIECES WITH 1080 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS

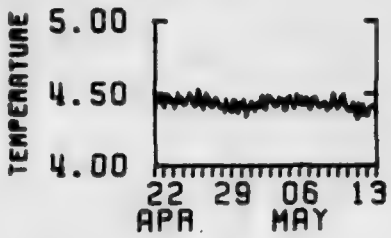


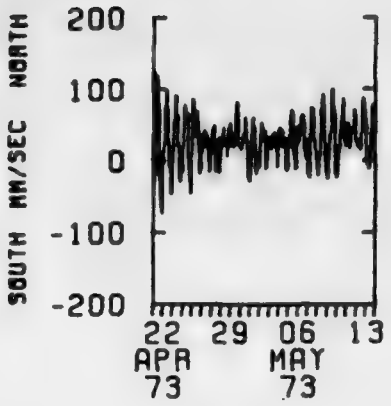
4935B900

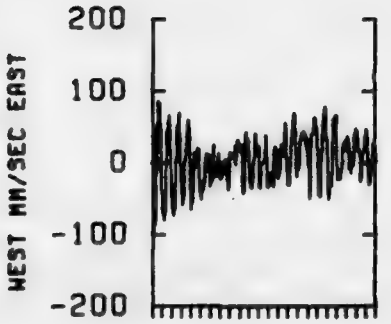
1410 M

73- IV -22 TO 73- V -13



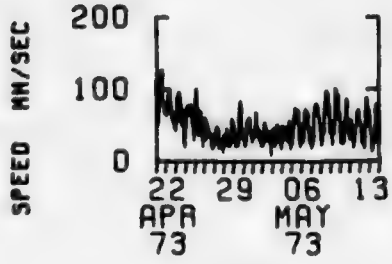






4935B1H

1410 M



DATA NUMBER 4936

Instrument No.: V-0138

Type: Vector Averaging Current Meter

Depth: 2933 m

Water Depth: 5446 m

Start time: 73-April-01 01.07.30.

Stop time: 73-April-21 04.52.30.

Duration: 20d 3h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

Compass - good

Vane - sticky April 21 to 29, stuck April 29 to recovery

Rotor - good

Temperature - good

STATS DATA/ 49360900A

	EAST	NORTH	SPEED	***** EAST & NORTH	*****
MEAN =	-21.83	48.25	56.46	COVARIANCE =	-43.82
STD. ERR. =	.43	.42	.40	STD. ERR. OF COVARIANCE =	25.28
VARIANCE =	381.45	334.00	312.85	STD. DEV. OF COVARIANCE =	1112.47
STD. DEV. =	19.01	18.28	17.69	CORRELATION COEFFICIENT =	-.128
KURTOSIS =	3.08	3.82	3.03	VECTOR MEAN =	52.98
SKEWNESS =	-.33	-.20	.47	VECTOR VARIANCE =	347.72
				STD. DEV. =	18.65

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 1936 POINTS

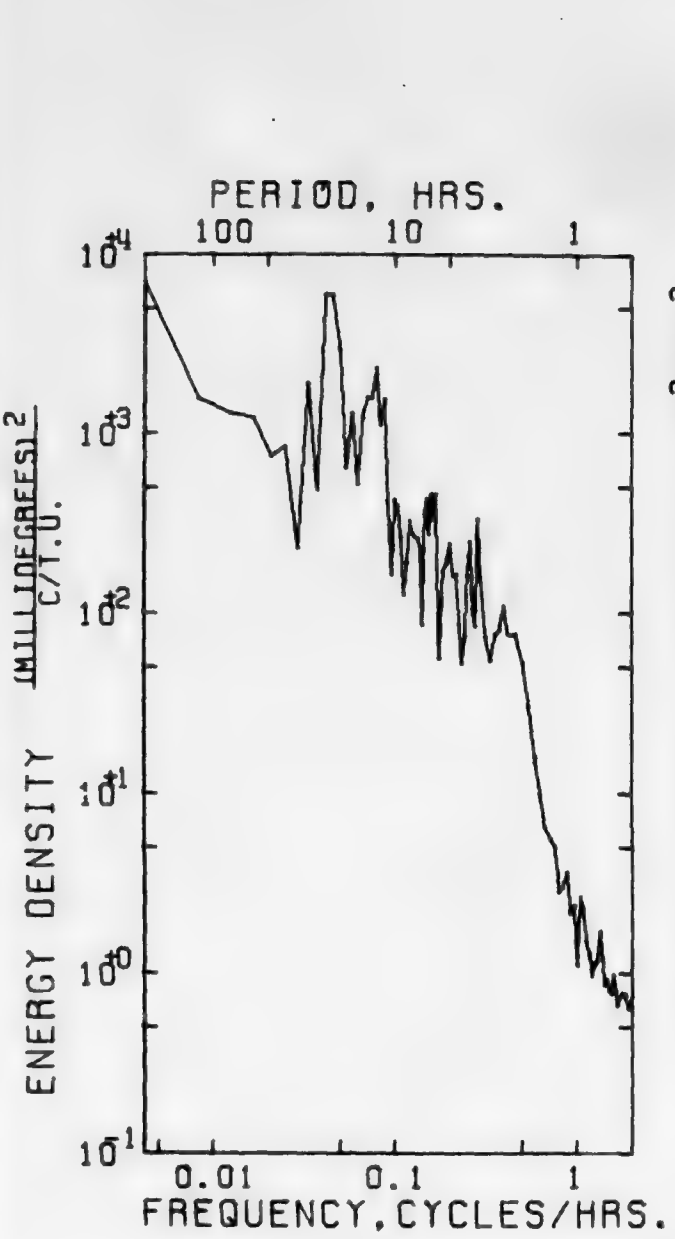
SPANNING RANGE
FROM 73- IV -01 01.07.30
TO 73- IV -21 04.52.30

DURATION 20 DAYS 3 H 45 M

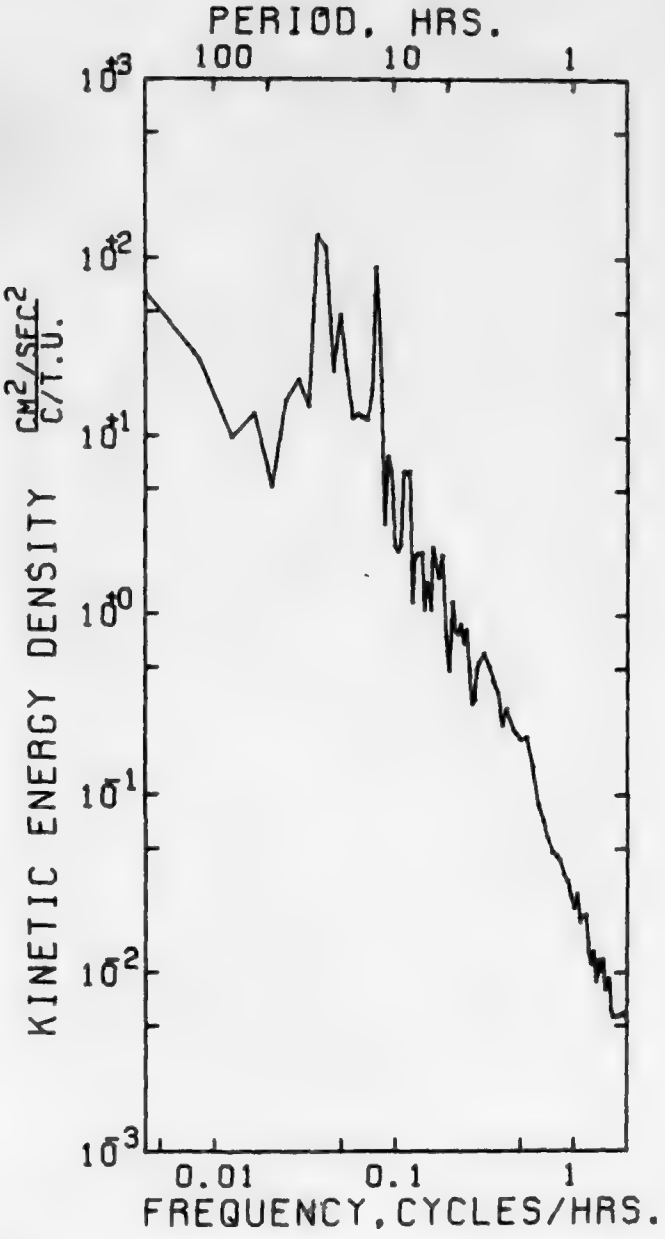
*** TEMPERATURE ***
*** DEGREES C. ***

MEAN = 2.750 STD ERR = .000
VARIANCE = .000
STD. DEV. = .016
KURTOSIS = 5.658
SKEWNESS = .718

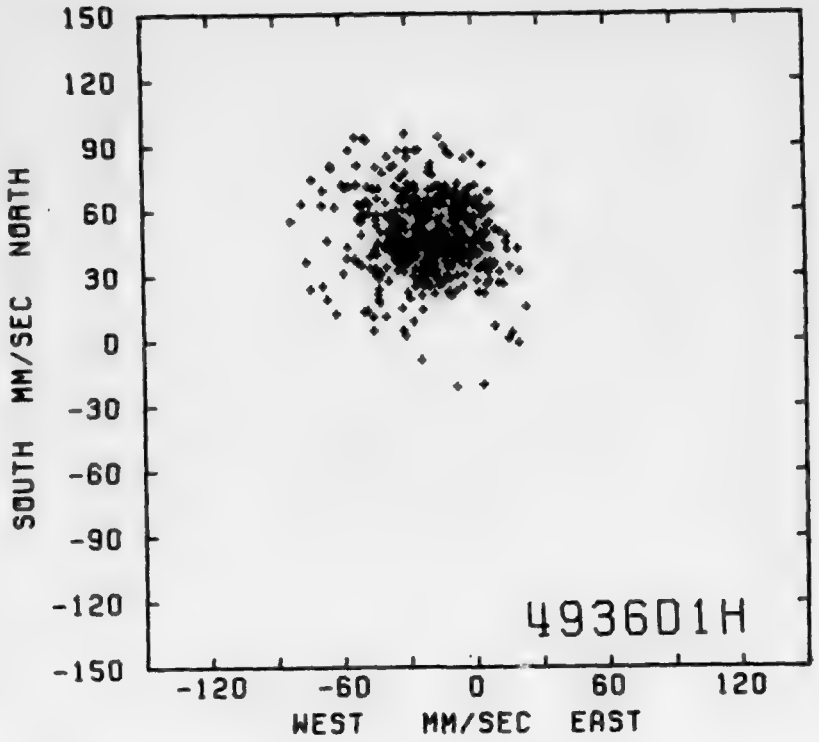
SAMPLE SIZE = 1936 POINTS



AUTO SPECTRUM
49360900 TEMPERATURE
2933 METERS
73-IV-01 TO 73-IV-20
1 PIECES WITH 960 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS



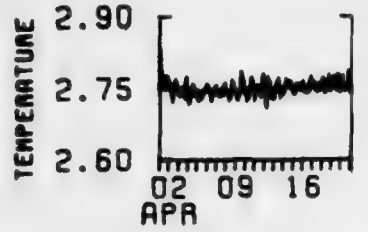
AUTO SPECTRUM
49360900 EAST
49360900 NORTH
2933 METERS
73-IV-01 TO 73-IV-21
1 PIECES WITH 960 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS

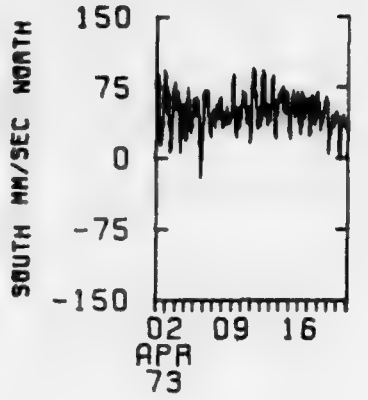


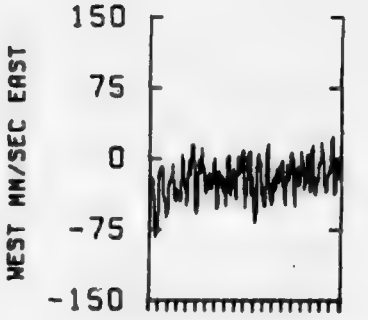
49360900

2933 M

73- IV -02 TO 73- IV -21

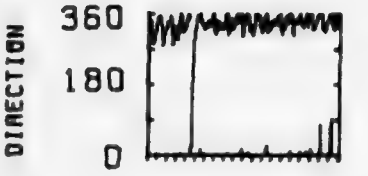


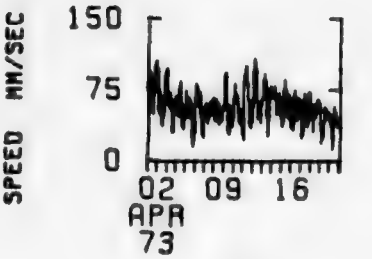




4936D1H

2933 M





Mooring No. 494

Set 1973 April 1 (Year Month Day) — 27° 49.3'N (Latitude) — 70° 39.8'W (Longitude)

Set by J. Gifford - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 2

Retrieved 1973 June 29 (Year Month Day)

Retrieved by J. Gifford - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 6

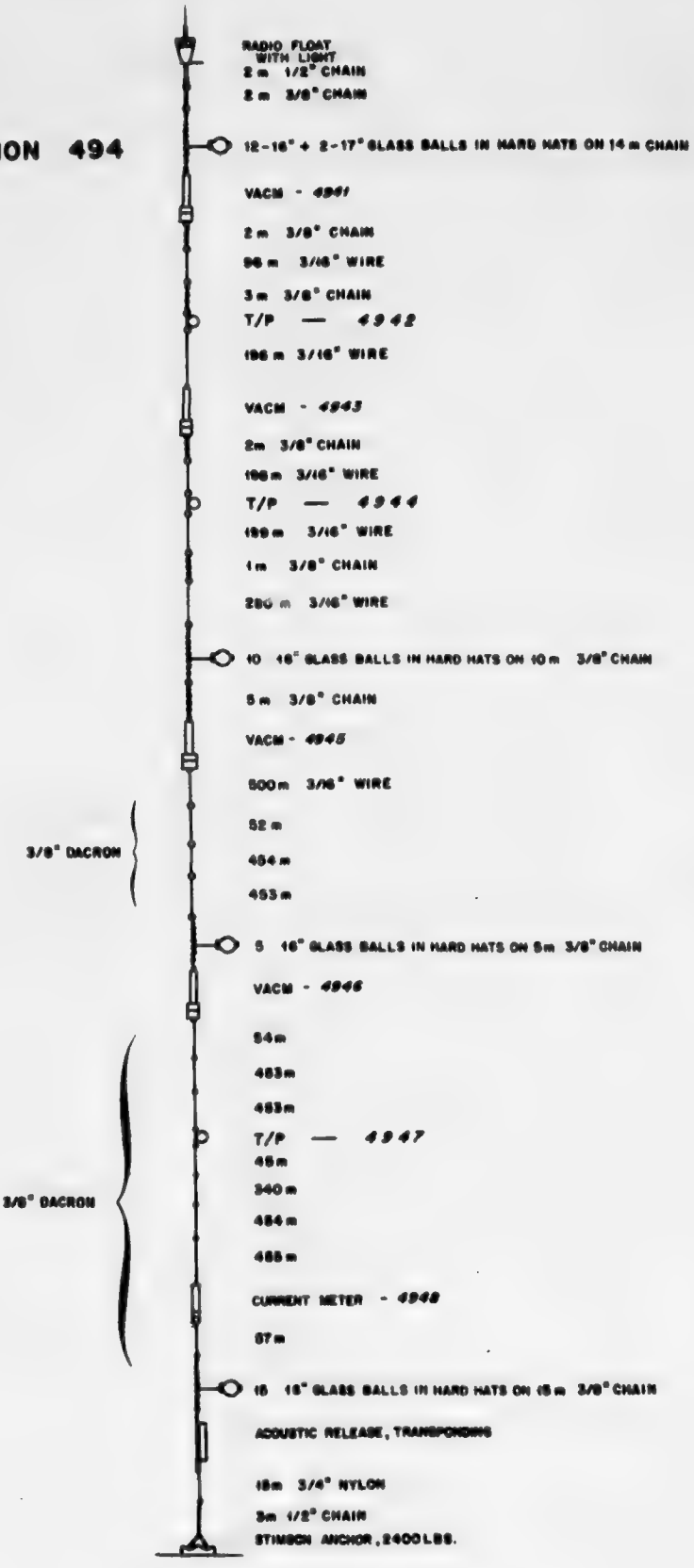
Purpose of Mooring: Mooring #5 of MODE 1 array

Mooring Type: Subsurface mooring

Key	Data Number	Instrument Number	Type	Depth Meters	Comments
*	4941	V-0127	VACM	391	
#	4942	#33	T/P	492	M.I.T.
	4943	V-0157	VACM	691	I.O.S.
#	4944	#51	T/P	893	M.I.T.
+	4945	V-0118	VACM	1395	
+	4946	V-0133	VACM	2924	
#	4947	#24	T/P	3954	M.I.T.
	4948	M-280	850	5346	U.R.I.
	Water depth			5446	

COMMENTS ON MOORING:

STATION 494


RADIO FLOAT WITH LIGHT
2 m 1/2" CHAIN
2 m 3/8" CHAIN
12-16" + 2-17" GLASS BALLS IN HARD HATS ON 14 m CHAIN
VACM - 4941
2 m 3/8" CHAIN
96 m 3/16" WIRE
3 m 3/8" CHAIN
T/P — 4942
196 m 3/16" WIRE
VACM - 4943
2m 3/8" CHAIN
196 m 3/16" WIRE
T/P — 4944
196 m 3/16" WIRE
1 m 3/8" CHAIN
280 m 3/16" WIRE
10 16" GLASS BALLS IN HARD HATS ON 10 m 3/8" CHAIN
5 m 3/8" CHAIN
VACM - 4945
500 m 3/16" WIRE
3/8" DACRON
52 m
454 m
453 m
5 16" GLASS BALLS IN HARD HATS ON 5m 3/8" CHAIN
VACM - 4946
54 m
453 m
453 m
T/P — 4947
45 m
340 m
454 m
455 m
3/8" DACRON
CURRENT METER - 4948
57 m
15 16" GLASS BALLS IN HARD HATS ON 15 m 3/8" CHAIN
ACOUSTIC RELEASE, TRANSPONDING
15m 3/4" NYLON
3m 1/2" CHAIN
STIMSON ANCHOR, 2400 LBS.

DATA NUMBER 4941

Instrument No.: V-0127 Type: Vector Averaging Current Meter

Depth: 391 m Water Depth: 5446 m

Start time: 73-April-01 12.07.30.

Stop time: 73-June-28 16.52.30.

Duration: 88d 4h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

All variables look good for entire record

STATS DATA/ 4941080OA

	EAST	NORTH	SPEED
MEAN =	8.43	48.82	113.46
STD. ERR. =	.72	.98	.53
VARIANCE =	4448.78	8307.65	2446.00
STD. DEV. =	66.70	81.15	48.47
KURTOSIS =	2.83	2.20	2.52
SKEWNESS =	-.21	-.20	.24

***** EAST & NORTH *****	
COVARIANCE =	324.17
STD. ERR. OF COVARIANCE =	70.70
STD. DEV. OF COVARIANCE =	8551.10
CORRELATION COEFFICIENT =	.053
VECTOR MEAN =	50.83
VECTOR VARIANCE =	8378.22
STD. DEV. =	78.66

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 8564 POINTS

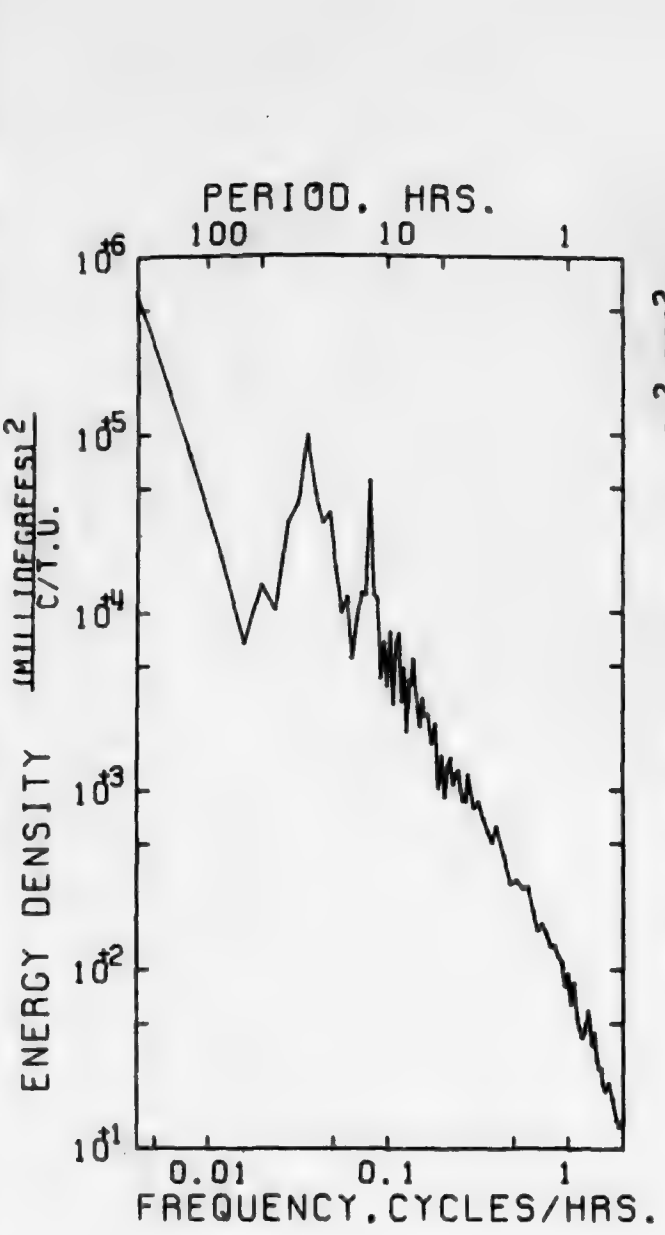
SPANNING RANGE
FROM 73- IV -01 12.07.30
TO 73- VI -28 16.52.30

DURATION 88 DAYS 4 H 45 M

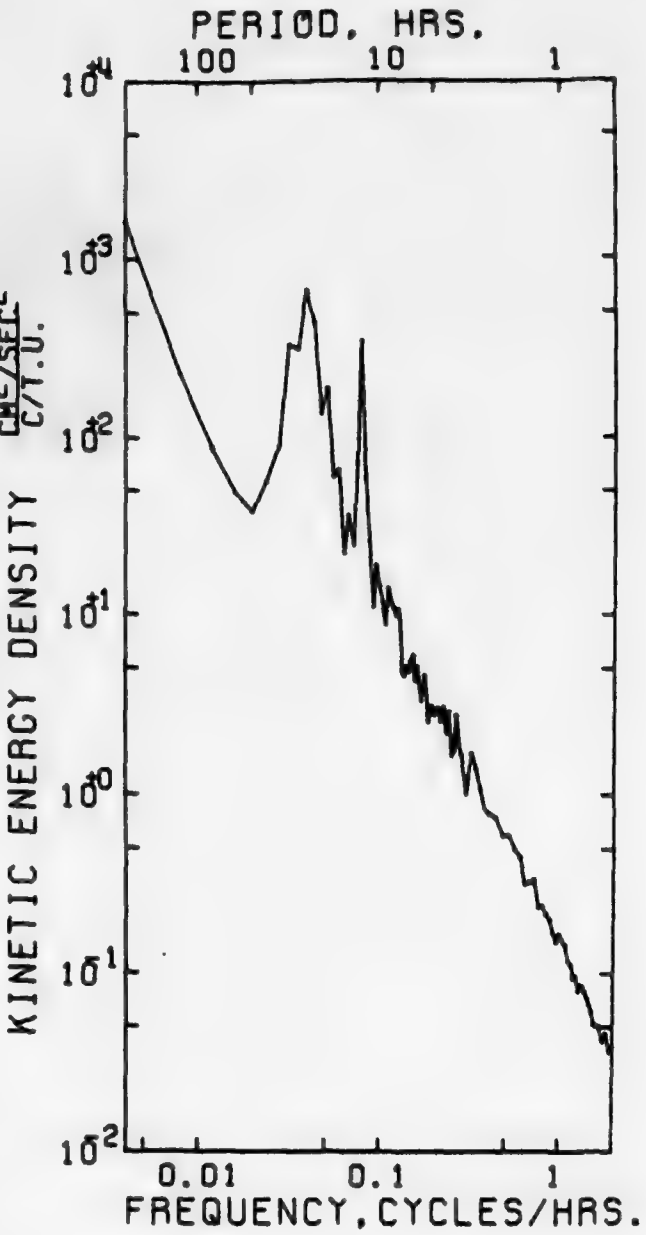
*** TEMPERATURE ***
*** DEGREES C. ***

MEAN =	17.654	STD ERR =	.002
VARIANCE =	.043		
STD. DEV. =	.209		
KURTOSIS =	2.367		
SKEWNESS =	.542		

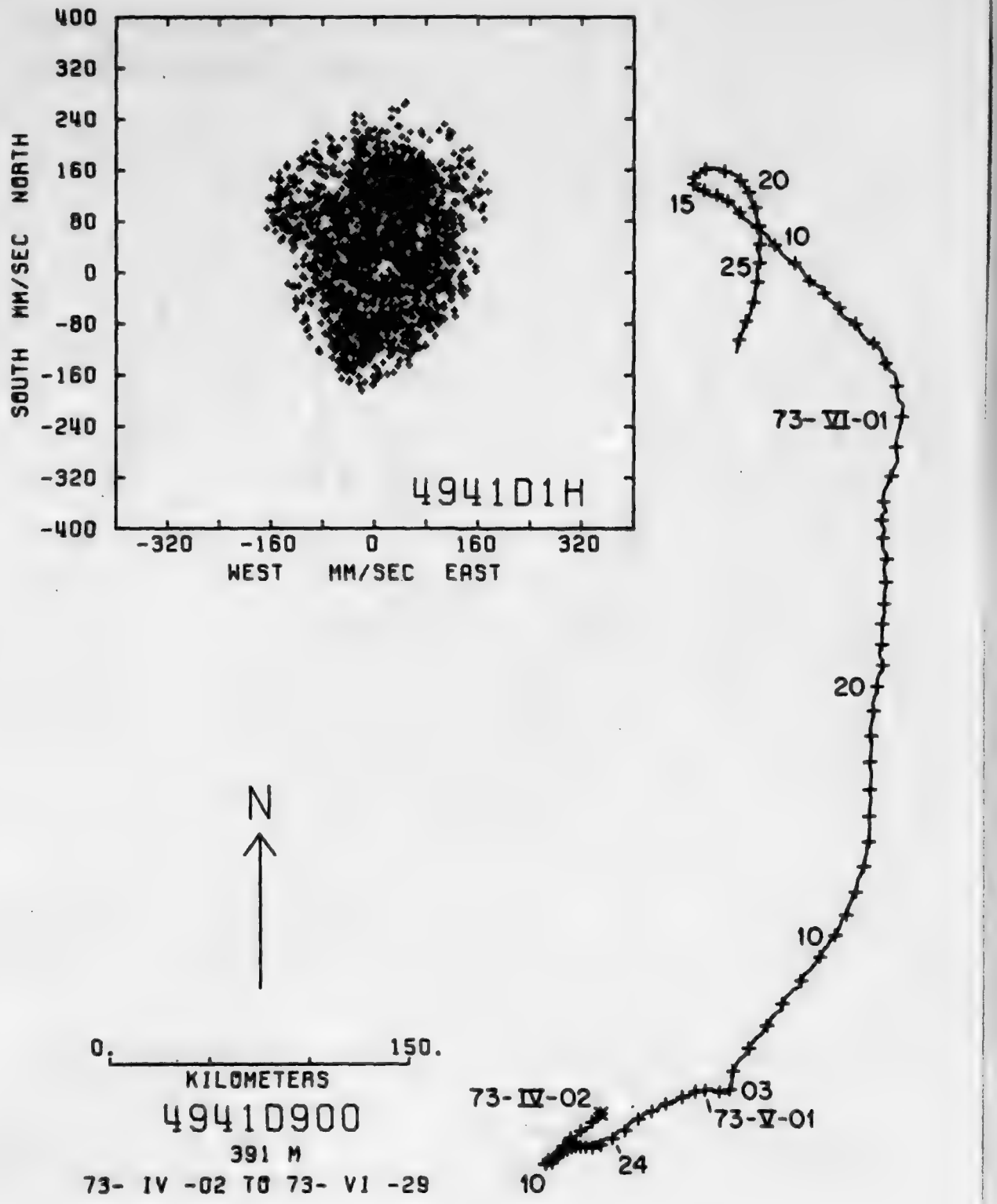
SAMPLE SIZE = 8564 POINTS

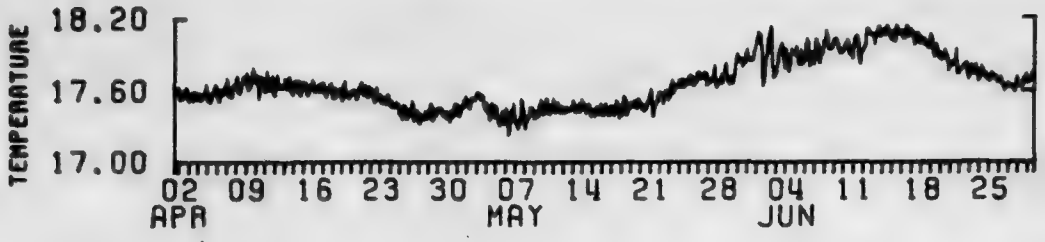


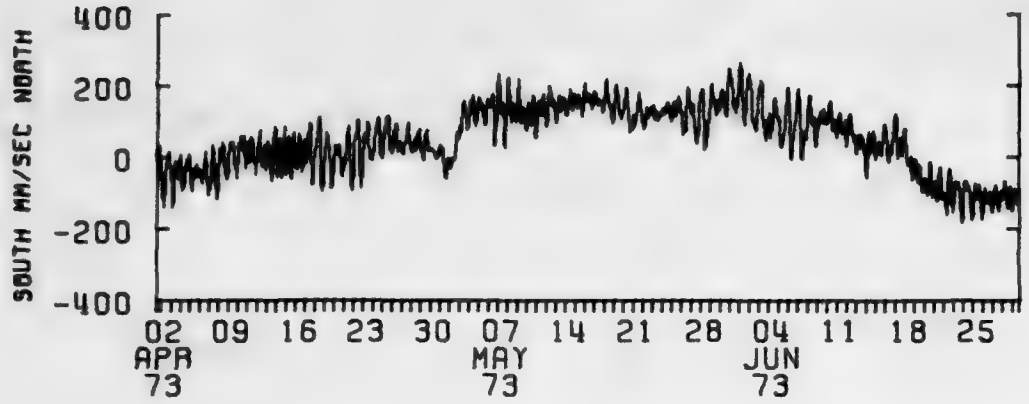
AUTO SPECTRUM
49410900 TEMPERATURE
391 METERS
73-IV-01 TO 73-VI-23
1 PIECES WITH 4000 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS

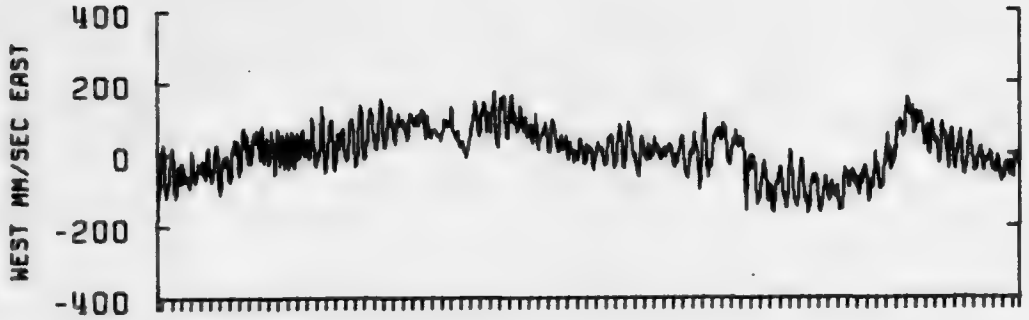


AUTO SPECTRUM
49410900 EAST
49410900 NORTH
391 METERS
73-IV-01 TO 73-VI-23
1 PIECES WITH 4000 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS


400
320
240
160
80
0
-80
-160
-240
-320
-400
SOUTH MM/SEC NORTH
-320
-160
0
160
320
WEST
MM/SEC
EAST
4941D1H
20
15
10
25
73-VI-01
20
10
N
0.
150.
KILOMETERS
49410900
391 M
73- IV -02 TO 73- VI -29
73-IV-02
03
73-V-01
24
10

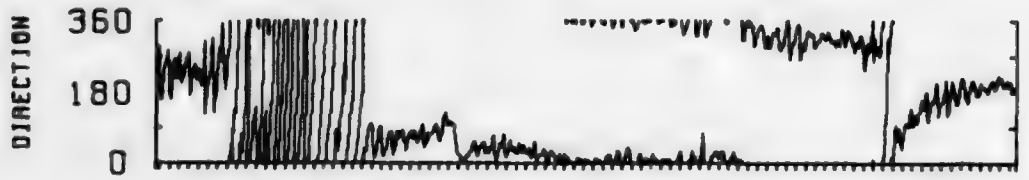


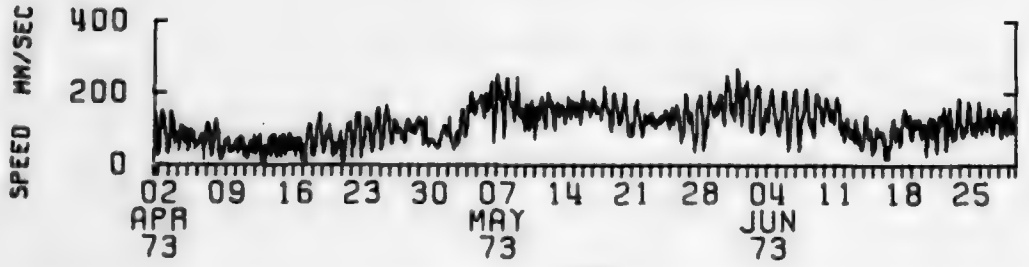




4941D1H

391 M





Mooring No. 495

Set 1973 April 1 (Year Month Day) 27° 08.8'N (Latitude) 70° 00.0'W (Longitude)

Set by G. Tupper - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 2

Retrieved 1973 June 29 (Year Month Day)

Retrieved by G. Tupper - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 6

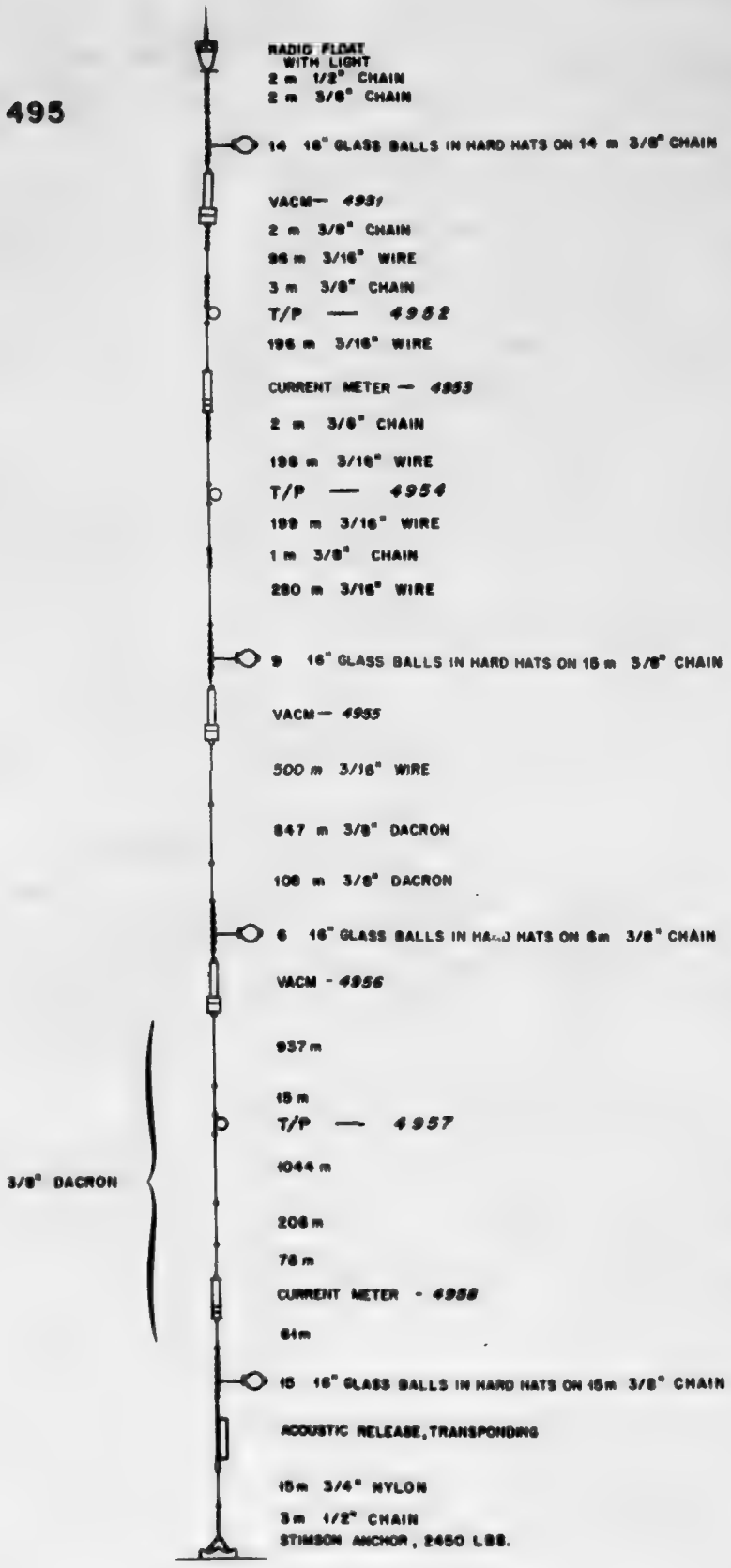
Purpose of Mooring: Mooring #10 of MODE 1 array

Mooring Type: Subsurface

Key	Data Number	Instrument Number	Type	Depth Meters	Comments
+	4951	V-0163	VACM	452	
#	4952	#38	T/P	554	M.I.T.
*	4953	M-212t	850t	753	Bad temperature data
	4954	#56	T/P	854	M.I.T.
*	4955	V-0105	VACM	1452	
	4956	V-0203	VACM	2959	Flooded
#	4957	#26	T/P	3962	M.I.T.
+	4958	M-122t	850t	5374	
	Water depth			5477	

COMMENTS ON MOORING:

STATION 495


RADIO FLOAT
WITH LIGHT
2 m 1/2" CHAIN
2 m 3/8" CHAIN
14 16" GLASS BALLS IN HARD HATS ON 14 m 3/8" CHAIN
VACM— 4951
2 m 3/8" CHAIN
96 m 3/16" WIRE
3 m 3/8" CHAIN
T/P — 4952
196 m 3/16" WIRE
CURRENT METER — 4953
2 m 3/8" CHAIN
198 m 3/16" WIRE
T/P — 4954
199 m 3/16" WIRE
1 m 3/8" CHAIN
280 m 3/16" WIRE
9 16" GLASS BALLS IN HARD HATS ON 18 m 3/8" CHAIN
VACM— 4955
500 m 3/16" WIRE
847 m 3/8" DACRON
108 m 3/8" DACRON
6 16" GLASS BALLS IN HARD HATS ON 6m 3/8" CHAIN
VACM - 4956
937 m
15 m
T/P — 4957
3/8" DACRON
1044 m
206 m
76 m
CURRENT METER - 4958
64 m
15 16" GLASS BALLS IN HARD HATS ON 15m 3/8" CHAIN
ACOUSTIC RELEASE, TRANSPONDING
15m 3/4" NYLON
3m 1/2" CHAIN
STIMSON ANCHOR, 2450 LBS.

DATA NUMBER 4953

Instrument No.: M-212t

Type: Magnetic Tape Recording Current Meter

Depth: 753 m

Water depth: 5477 m

Start time: 73-April-01 23.00.34.

Stop time: 73-June-28 10.30.34.

Duration: 88d 11h 30m

Sampling scheme: Interval

time between strobes = seconds

no. of strobes per interval = 13

recording interval = 1800 seconds

COMMENTS:

Compass, vane, speed - look good

Temperature - bad

STATS DATA/ 4953F1800A

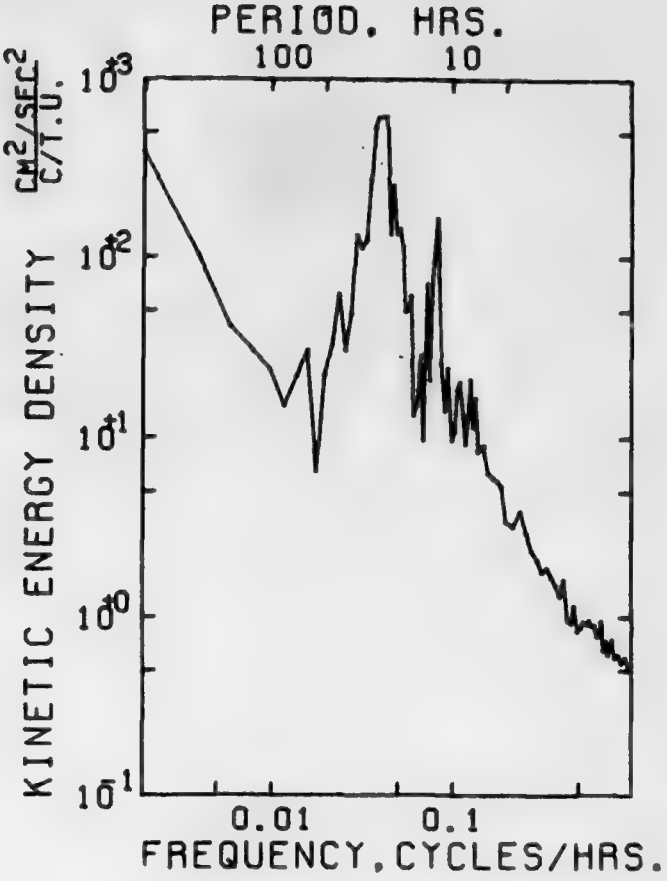
	EAST	NORTH	SPEED	******	EAST & NORTH	******
MEAN =	-83.47	-5.23	84.12	COVARIANCE =		-7.83
STD. ERR. =	.57	.69	.53	STD. ERR. OF COVARIANCE =		57.87
VARIANCE =	1366.33	1704.72	1207.04	STD. DEV. OF COVARIANCE =		5772.08
STD. DEV. =	36.96	41.29	34.74	CORRELATION COEFFICIENT =		-.005
KURTOSIS =	2.90	2.95	2.94	VECTOR MEAN =		83.83
SKEWNESS =	.01	.14	.10	VECTOR VARIANCE =		1595.59
				STD. DEV. =		39.18

UNITS OF RAW DATA VARIABLES = MM/SEC

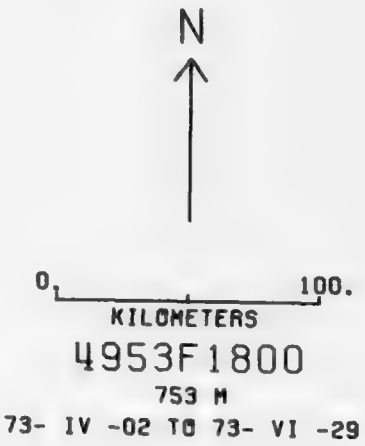
SAMPLE SIZE = 4248 POINTS

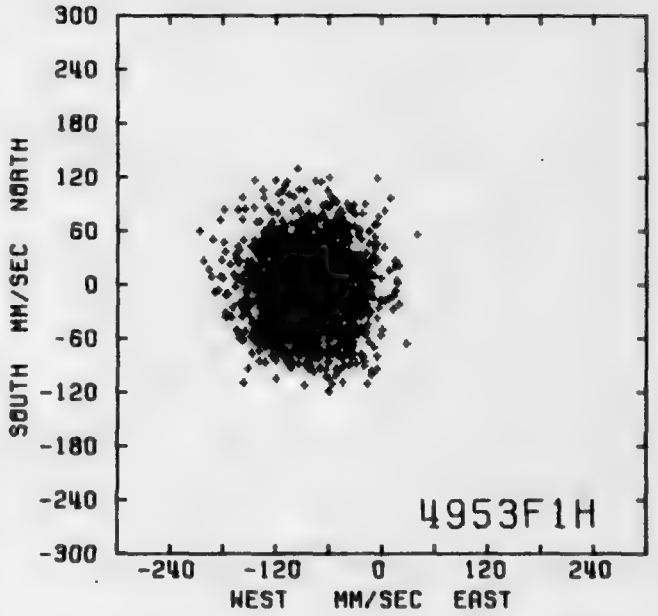
SPANNING RANGE
FROM 73- IV -01 23.00.34
TO 73- VI -28 10.30.34

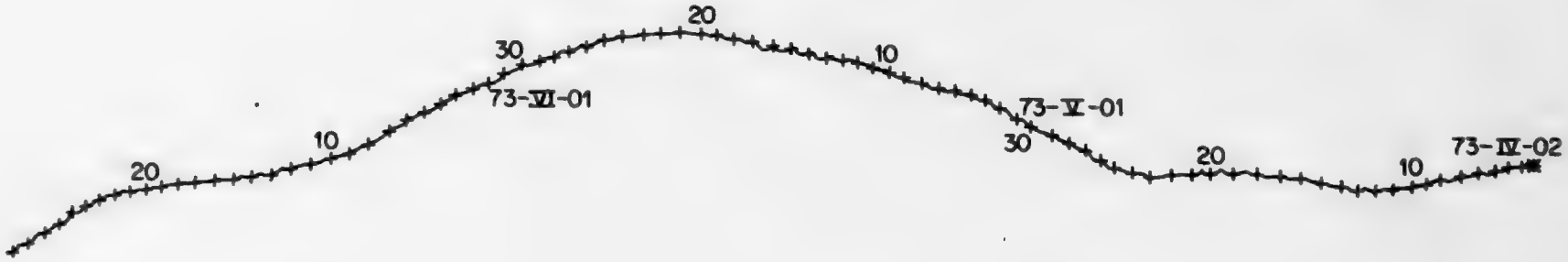
DURATION 88 DAYS 11 H 30 M 0 S

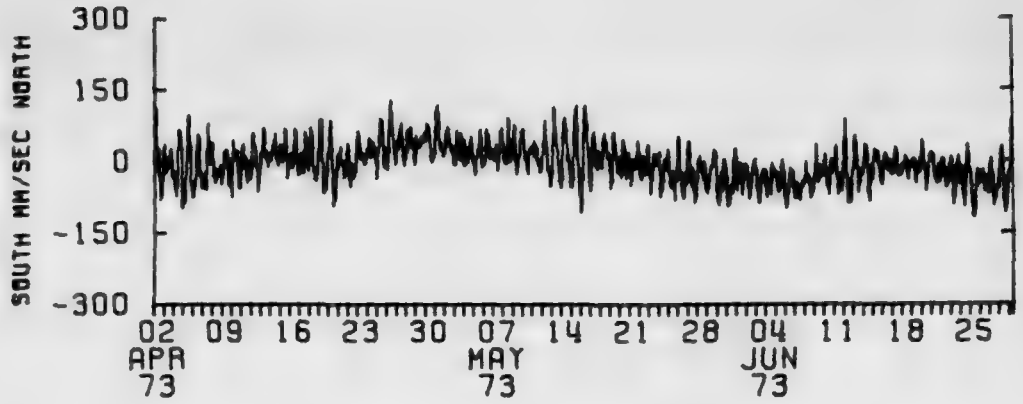


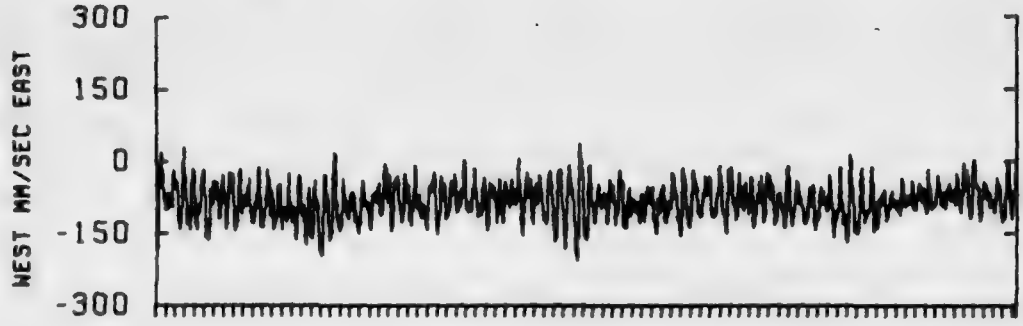
AUTO SPECTRUM
4953F1800 EAST
4953F1800 NORTH
753 METERS
73-IV-01 TO 73-VI-26
1 PIECES WITH 2048 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS


N
0
100.
KILOMETERS
4953F1800
753 M
73- IV -02 TO 73- VI -29


300
240
180
120
60
0
-60
-120
-180
-240
-300
SOUTH MM/SEC NORTH
-240
-120
0
120
240
WEST MM/SEC EAST
4953F1H

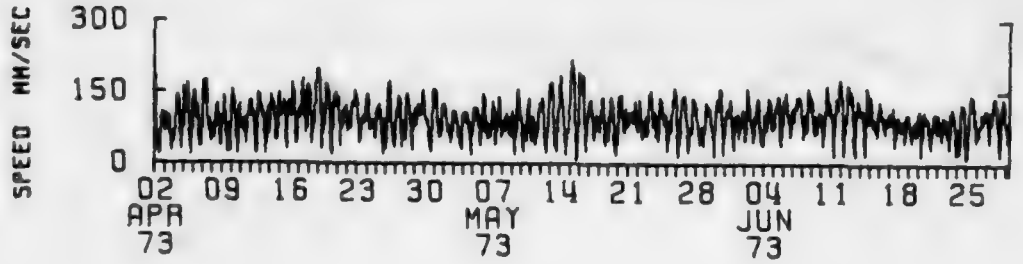

20
10
30
73-VI-01
20
10
73-V-01
30
20
10
73-IV-02





4953F1H

753 M



DATA NUMBER 4955

Instrument No.: V-0105 Type: Vector Averaging Current Meter

Depth: 1452 m Water Depth: 5477 m

Start time: 73-April-01 21.07.30.

Stop time: 73-June-14 23.52.30.

Duration: 74d 2h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

Internal vector computer did not function correctly. To recover data East and North components were computed from instantaneous compass and vane values and accumulated rotor counts. Speed amplitude may be a little high.

Compass and vane data were not stored on tape unless there was a rotor count during the recording period. Temperature values were stored on tape regardless of rotor value.

1.

Current data looks good until June 15th after which some data is lost due to speed being at threshold (0 rotor count).

STATS DATA/ 4955E900A

	EAST	NORTH	SPEED	***** EAST & NORTH *****
MEAN =	-33.65	8.38	49.47	* COVARIANCE = 119.75
STD. ERR. =	.40	.34	.31	* STD. ERR. OF COVARIANCE = 17.62
VARIANCE =	1139.69	808.38	701.38	* STD. DEV. OF COVARIANCE = 1486.48
STD. DEV. =	33.76	28.40	26.48	* CORRELATION COEFFICIENT = .125
KURTOSIS =	3.24	2.93	3.86	* VECTOR MEAN = 34.68
SKEWNESS =	-.41	-.29	1.01	* VECTOR VARIANCE = 979.04
				* STD. DEV. = 31.19

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 7116 POINTS

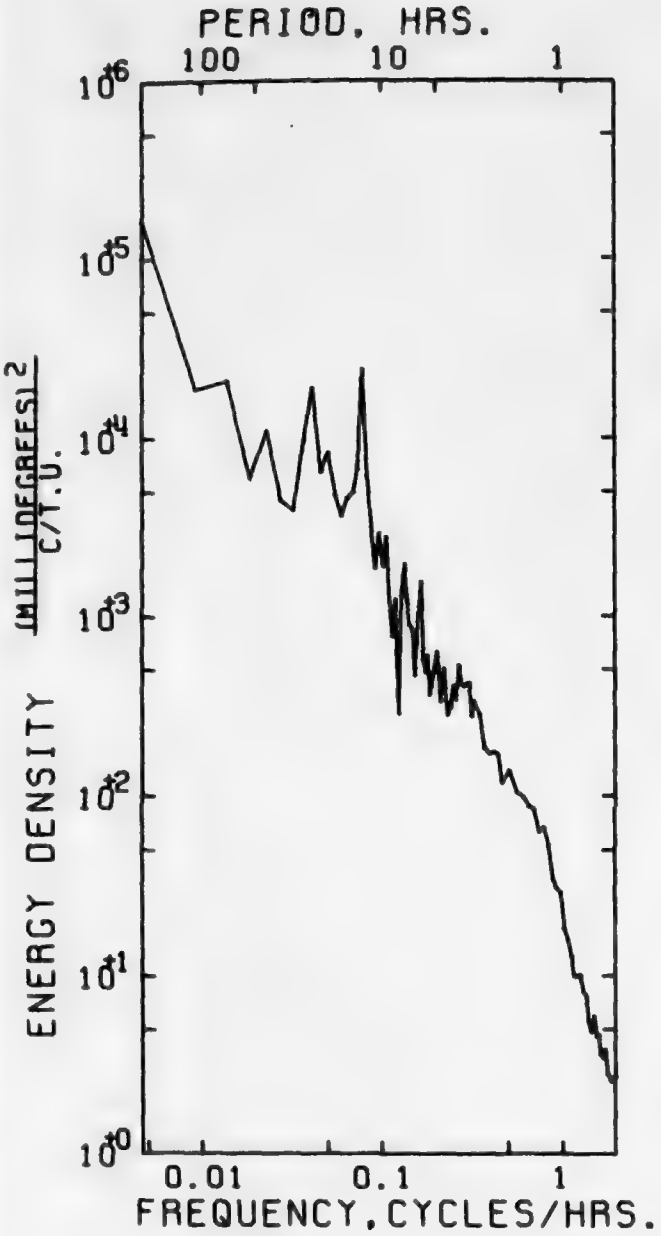
*** TEMPERATURE ***
*** DEGREES C. ***

SPANNING RANGE
FROM 73- IV -01 21.07.30
TO 73- VI -14 23.52.30

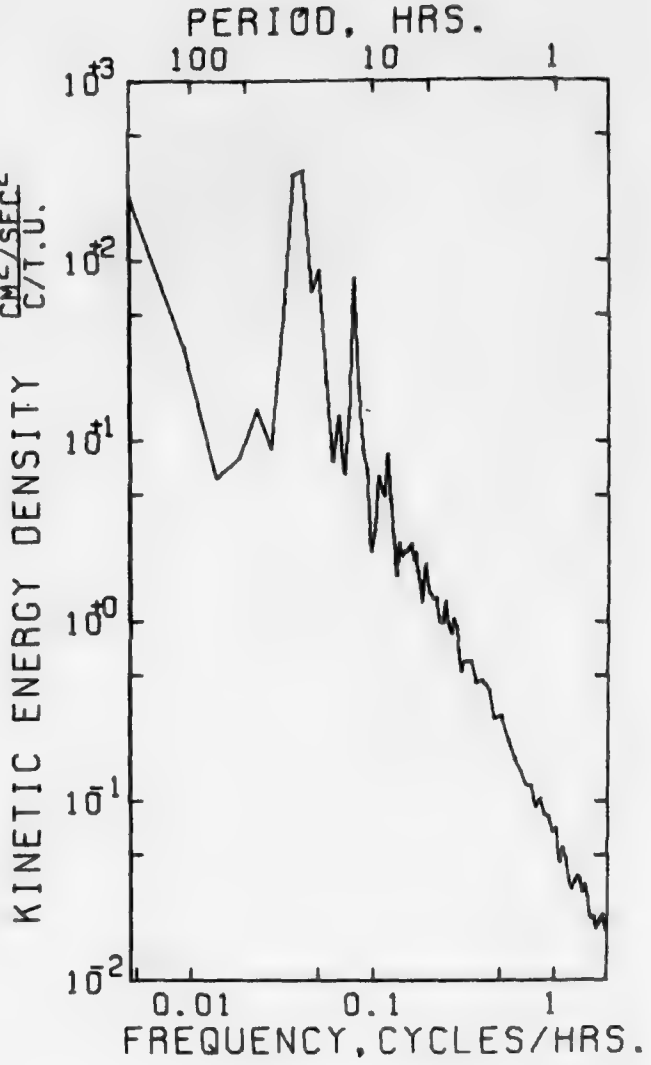
DURATION 74 DAYS 2 H 45 M

MEAN	=	4.451	STD ERR = .001
VARIANCE	=	.004	
STD. DEV.	=	.065	
KURTOSIS	=	2.572	
SKEWNESS	=	-.273	

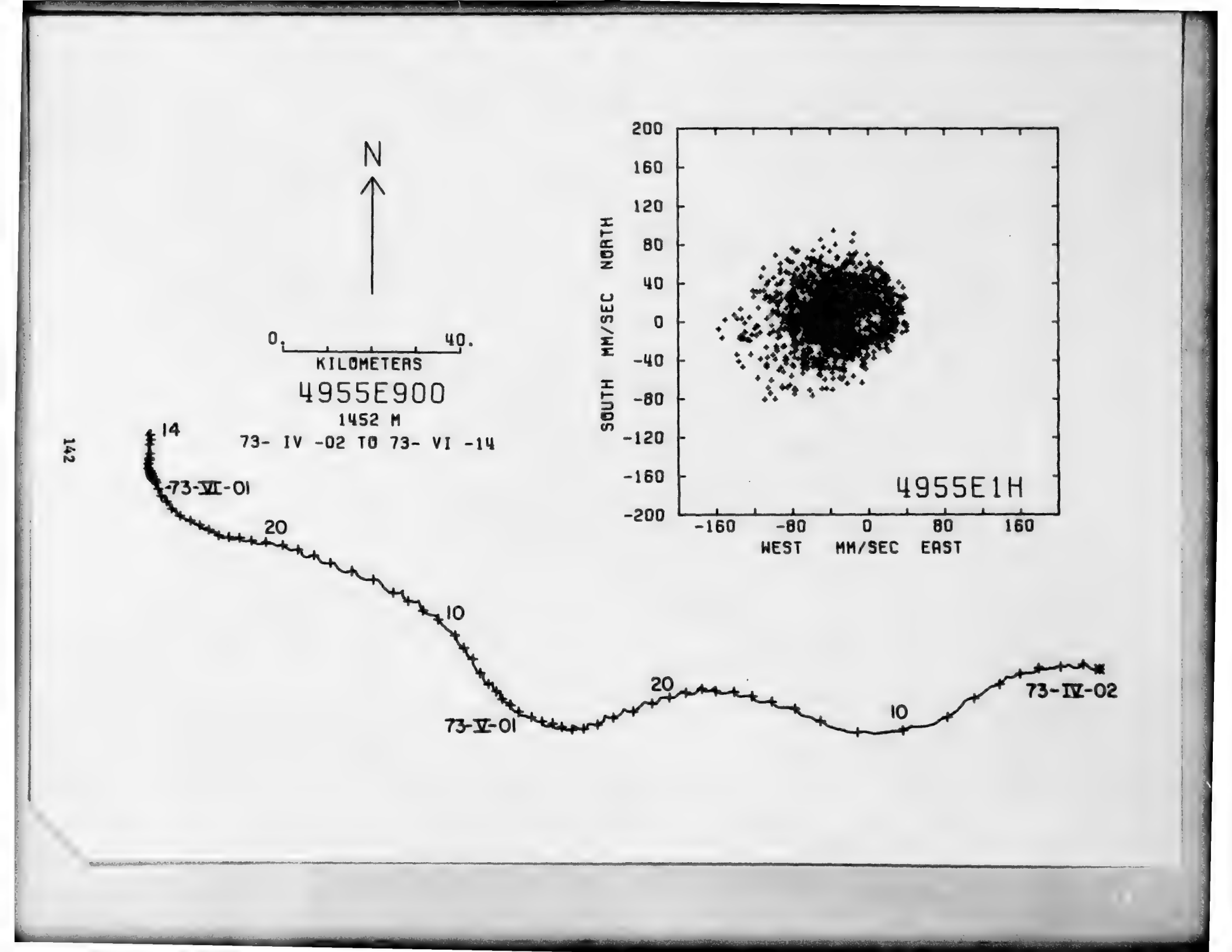
SAMPLE SIZE = 7116 POINTS

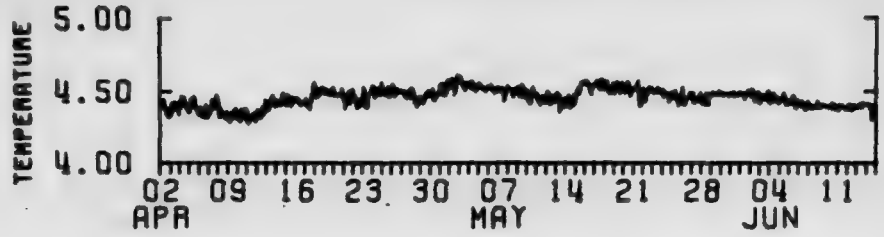


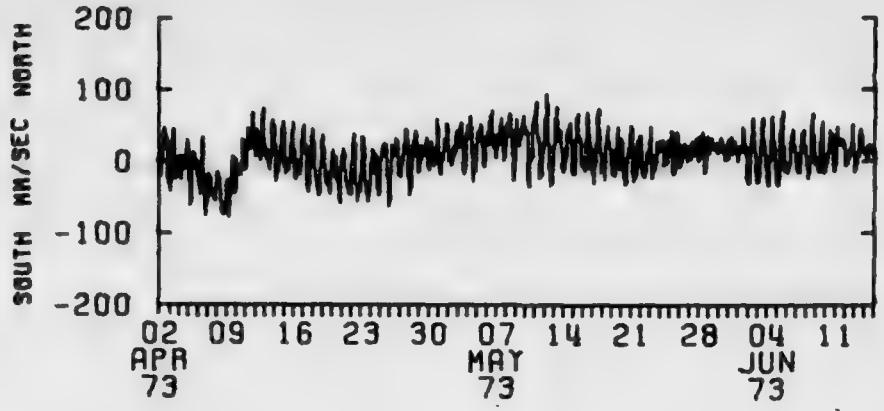
AUTO SPECTRUM
4955E900 TEMPERATURE
1452 METERS
73-IV-01 TO 73-VI-11
1 PIECES WITH 3456 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS

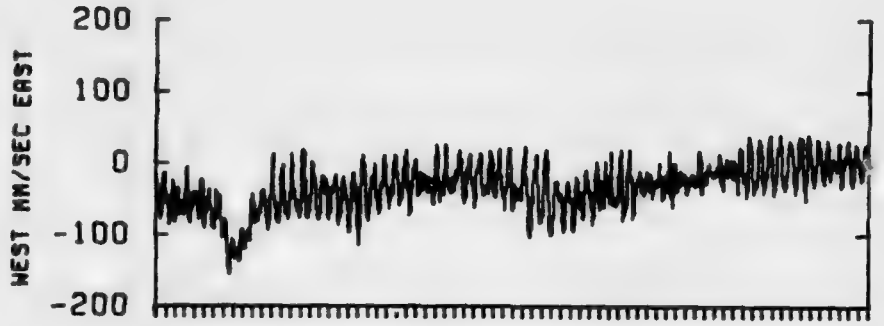


AUTO SPECTRUM
4955E900 EAST
4955E900 NORTH
1452 METERS
73-IV-01 TO 73-VI-12
1 PIECES WITH 3456 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS


N
0.
40.
KILOMETERS
4955E900
1452 M
73- IV -02 TO 73- VI -14
14
73-VI-01
20
10
73-V-01
20
10
73-IV-02
200
160
120
80
40
0
-40
-80
-120
-160
-200
SOUTH MM/SEC NORTH
-160
-80
0
80
160
WEST MM/SEC EAST
4955E1H

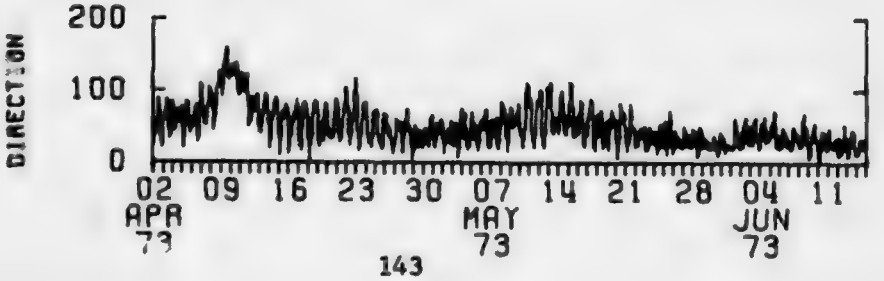






4955E1H

1452 M



Mooring No. 497

Set 1973 April 2 (Year Month Day) 27° 18.0'N (Latitude) 69° 01.0'W (Longitude)

Set by G. Tupper - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 2

Retrieved 1973 June 28 (Year Month Day)

Retrieved by J. Gifford - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 6

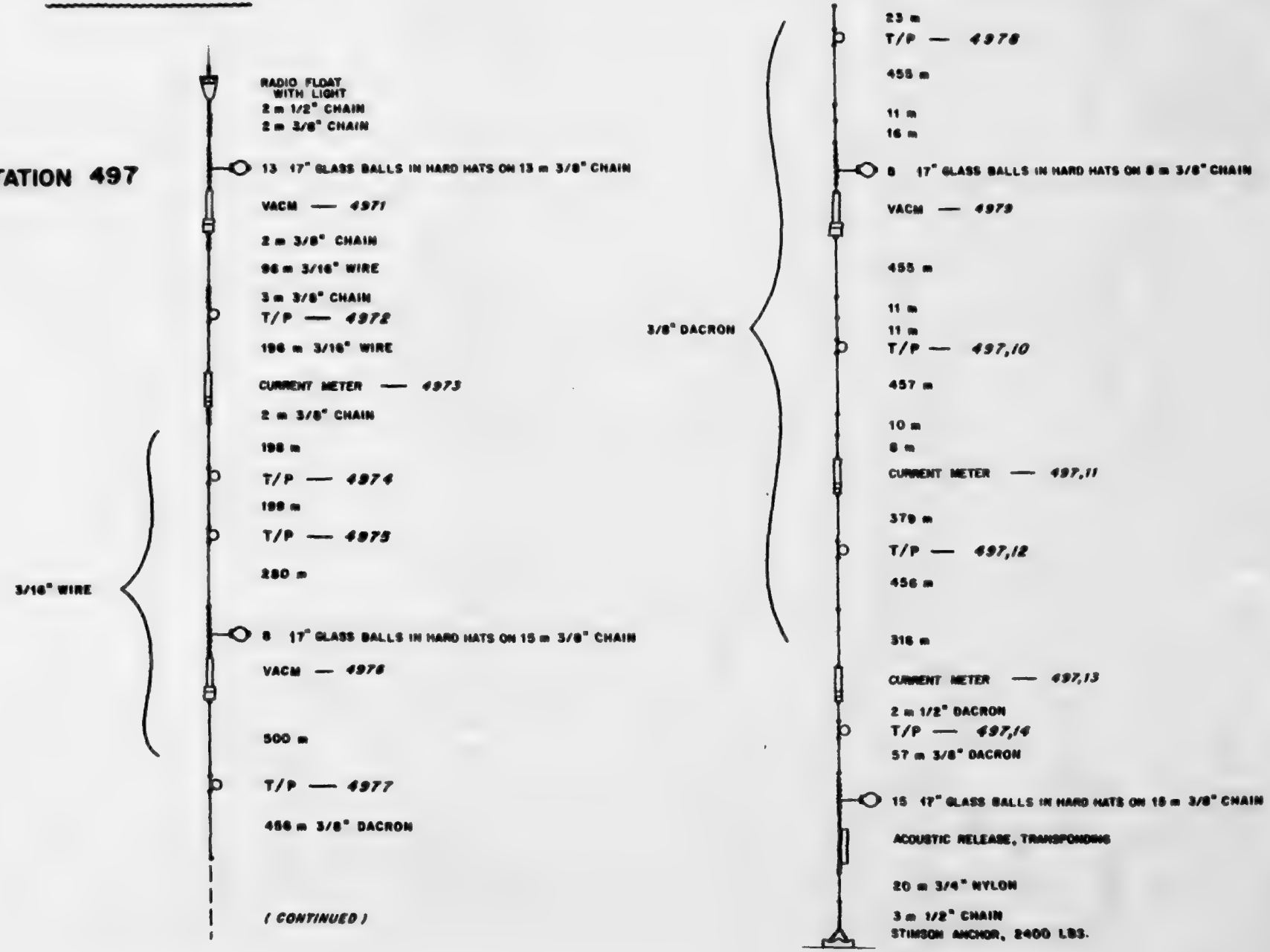
Purpose of Mooring: Mooring #9 of MODE 1 array

Mooring Type: Subsurface

Key	Data Number	Instrument Number	Type	Depth Meters	Comments
*	4971	V-0120	VACM	374	
#	4972	#37	T/P	478	M.I.T.
+	4973	M-213t	850t	676	
#	4974	#55	T/P	880	M.I.T.
#	4975	#59	T/P	1080	M.I.T.
	4976	V-0202	VACM	1380	Flooded
	4977	#06	T/P	1889	M.I.T.
#	4978	#18	T/P	2392	M.I.T.
	4979	V-0196	VACM	2913	Flooded
#	497,10	#08	T/P	3433	M.I.T.
*	497,11	M-206	850t	3940	
#	497,12	#31	T/P	4346	M.I.T.
*	497,13	M-129t	850t	5182	Temperature bad
#	497,14	#09	T/P	5185	M.I.T.
	Water depth			5296	

COMMENTS ON MOORING:

STATION 497


RADIO FLOAT
WITH LIGHT
2 m 1/2" CHAIN
2 m 3/8" CHAIN
13 17" GLASS BALLS IN HARD HATS ON 13 m 3/8" CHAIN
VACM — 4971
2 m 3/8" CHAIN
96 m 3/16" WIRE
3 m 3/8" CHAIN
T/P — 4972
196 m 3/16" WIRE
CURRENT METER — 4973
2 m 3/8" CHAIN
198 m
T/P — 4974
198 m
T/P — 4975
280 m
3/16" WIRE
8 17" GLASS BALLS IN HARD HATS ON 15 m 3/8" CHAIN
VACM — 4976
500 m
T/P — 4977
456 m 3/8" DACRON
(CONTINUED)
23 m
T/P — 4978
455 m
11 m
16 m
8 17" GLASS BALLS IN HARD HATS ON 8 m 3/8" CHAIN
VACM — 4979
455 m
11 m
11 m
T/P — 497,10
457 m
10 m
8 m
CURRENT METER — 497,11
379 m
T/P — 497,12
456 m
316 m
CURRENT METER — 497,13
2 m 1/2" DACRON
T/P — 497,14
57 m 3/8" DACRON
15 17" GLASS BALLS IN HARD HATS ON 15 m 3/8" CHAIN
ACOUSTIC RELEASE, TRANSPONDING
20 m 3/4" NYLON
3 m 1/2" CHAIN
STIMSON ANCHOR, 2400 LBS.
3/8" DACRON

DATA NUMBER 4971

Instrument No.: V-0120 Type: Vector Averaging Current Meter

Depth: 374 m Water Depth: 5296 m

Start time: 73-April-03 01.07.30.

Stop time: 73-June-11 01.52.30.

Duration: 68d 0h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

Compass - good

Vane - good

Rotor - threshold problems from June 11 to end

Temperature - good

STATS DATA/ 4971C800A

	EAST	NORTH	SPEED	#####	EAST & NORTH	#####
MEAN =	-80.72	-41.60	108.68	COVARIANCE =		-784.54
STD. ERR. =	.64	.58	.52	STD. ERR. OF COVARIANCE =		54.17
VARIANCE =	2708.10	2209.77	1788.85	STD. DEV. OF COVARIANCE =		4409.84
STD. DEV. =	52.04	48.84	42.07	CORRELATION COEFFICIENT =		-.325
KURTOSIS =	2.25	2.55	2.59	VECTOR MEAN =		90.78
SKEWNESS =	-.07	.15	-.09	VECTOR VARIANCE =		2455.84
				STD. DEV. =		49.56

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 6628 POINTS

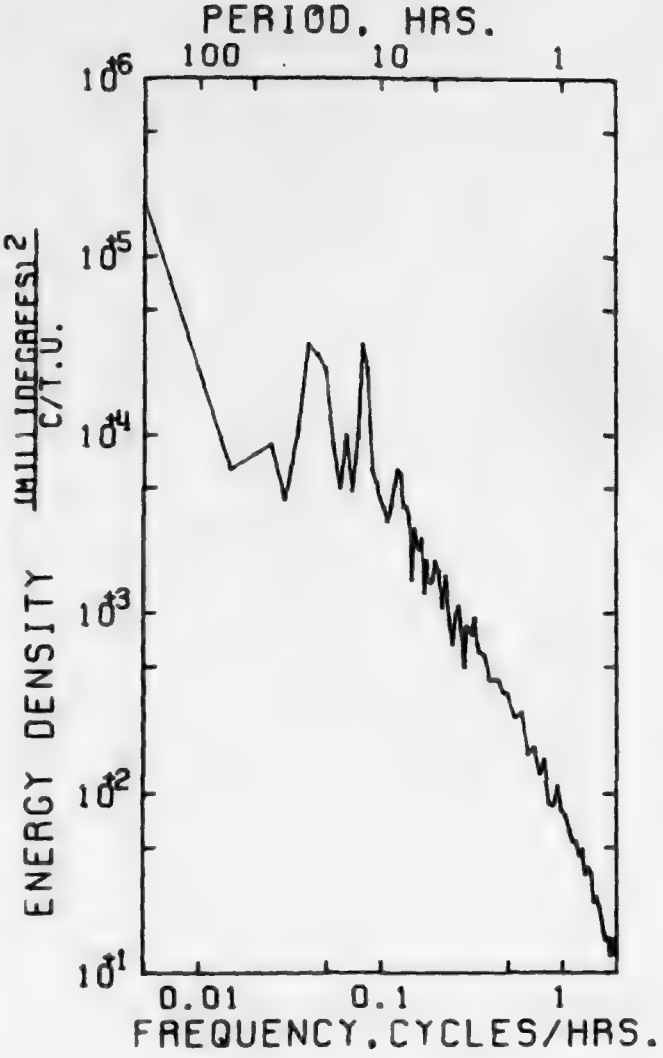
*** TEMPERATURE ***
*** DEGREES C. ***

SPANNING RANGE
FROM 73- IV -03 01.07.30
TO 73- VI -11 01.52.30

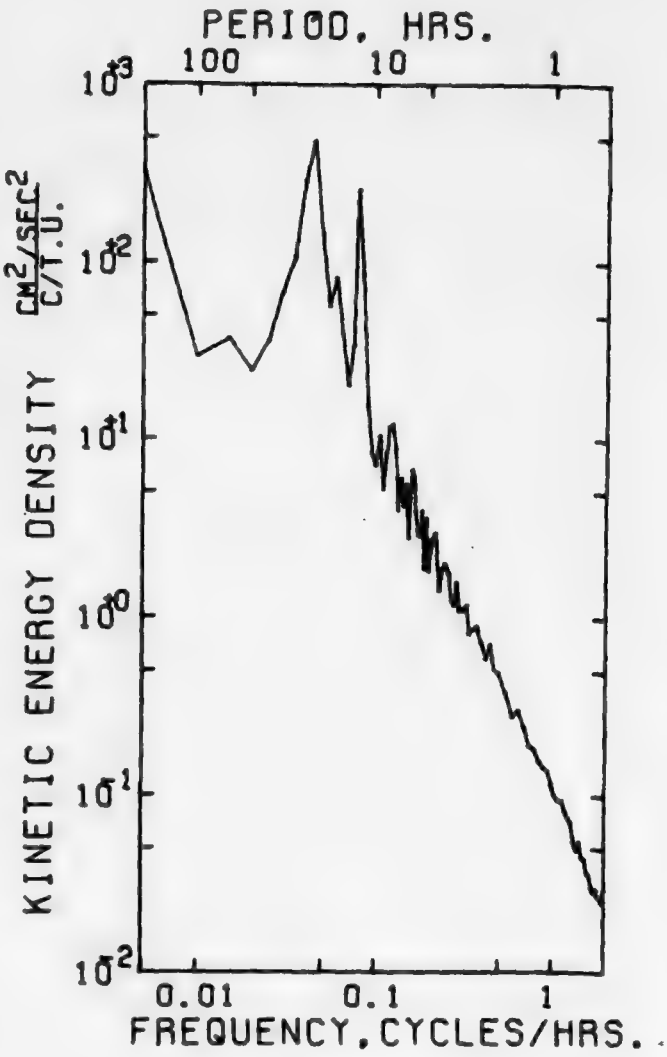
DURATION 68 DAYS 0 H 45 M

MEAN = 17.449 STD ERR = .002
VARIANCE = .015
STD. DEV. = .124
KURTOSIS = 2.149
SKEWNESS = -.177

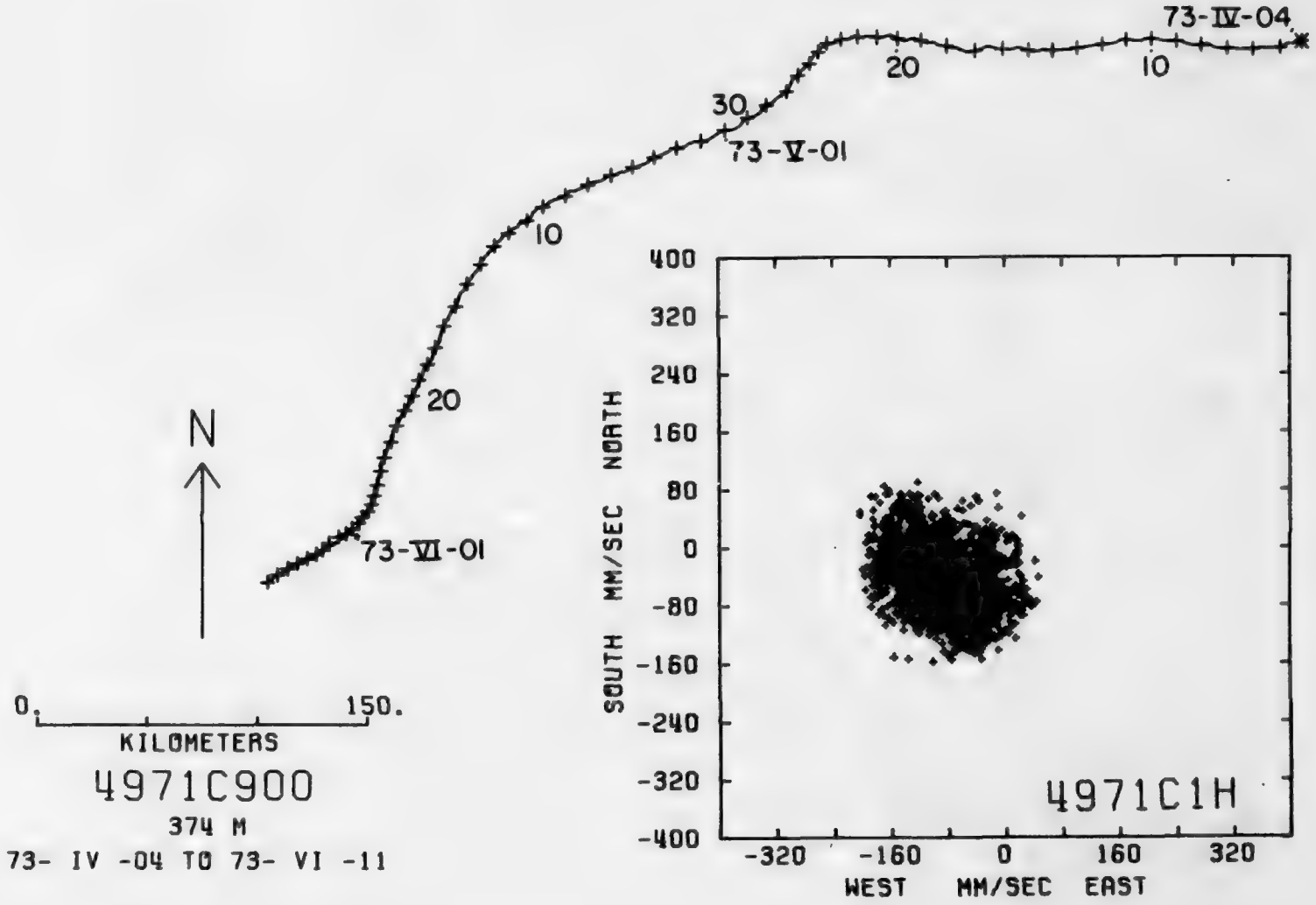
SAMPLE SIZE = 6628 POINTS

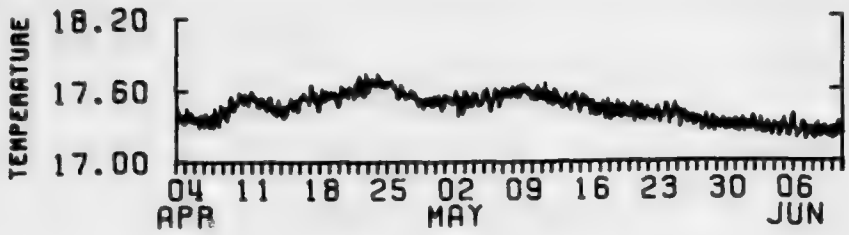


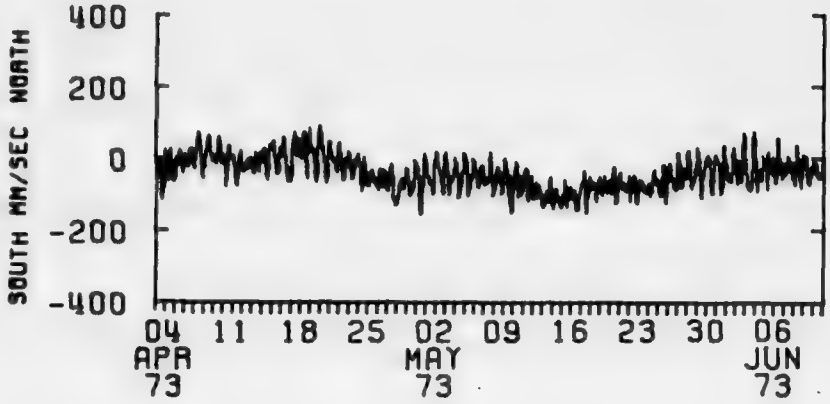
AUTO SPECTRUM
4971C900 TEMPERATURE
374 METERS
73-IV-03 TO 73-VI-09
1 PIECES WITH 3240 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS

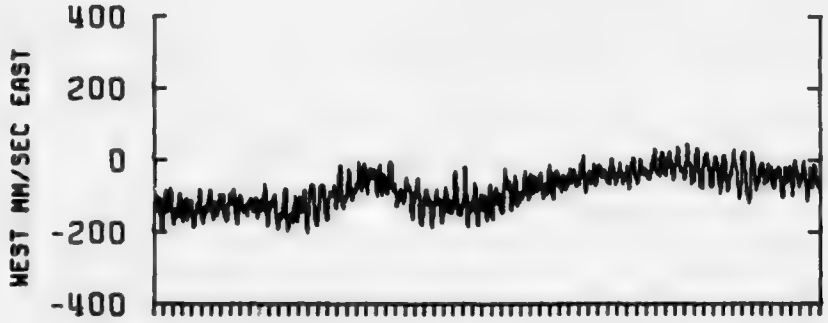


AUTO SPECTRUM
4971C900 EAST
4971C900 NORTH
374 METERS
73-IV-03 TO 73-VI-09
1 PIECES WITH 3240 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS


73-IV-04
20
10
30
73-V-01
10
20
N
73-VI-01
0.
150.
KILOMETERS
4971C900
374 M
73- IV -04 TO 73- VI -11
400
320
240
160
80
0
-80
-160
-240
-320
-400
SOUTH MM/SEC NORTH
-320
-160
0
160
320
WEST MM/SEC EAST
4971C1H

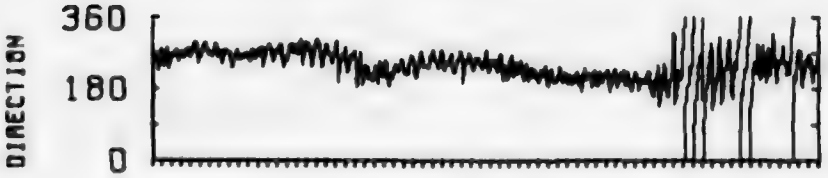


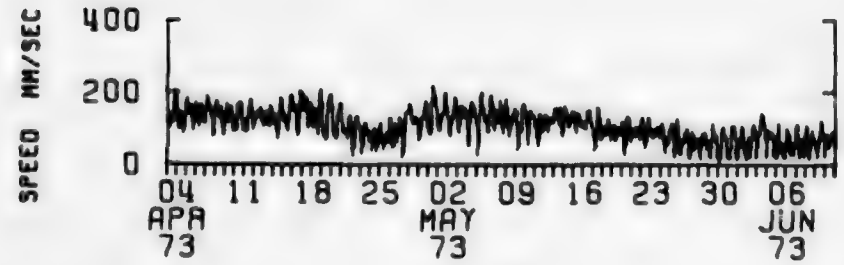




4971C1H

374 M





DATA NUMBER 497,11

Instrument No.: M-206t

Type: Magnetic Tape Recording Current Meter

Depth: 3940 m

Water depth: 5296 m

Start time: 73-April-03 07.00.34.

Stop time: 73-June-28 18.30.34.

Duration: 86d 11h 30m

Sampling scheme: Interval

time between strobes = 527 seconds

no. of strobes per interval = 13

recording interval =1800 seconds

COMMENTS:

Vane out of top bearing at recovery. May have occurred during recovery.

All variables look good entire record

STATS DATA/ 497.11R1800R

	EAST	NORTH	SPEED	***** EAST & NORTH *****
MEAN =	-5.67	-20.17	31.44	COVARIANCE = 197.62
STD. ERR. =	.32	.32	.20	STD. ERR. OF COVARIANCE = 11.67
VARIANCE =	433.87	431.78	318.09	STD. DEV. OF COVARIANCE = 752.17
STD. DEV. =	20.83	20.78	17.78	CORRELATION COEFFICIENT = .457
KURTOSIS =	3.15	4.05	4.98	VECTOR MEAN = 20.85
SKEWNESS =	-.32	-.48	1.45	VECTOR VARIANCE = 432.83
				STD. DEV. = 20.80

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 4152 POINTS

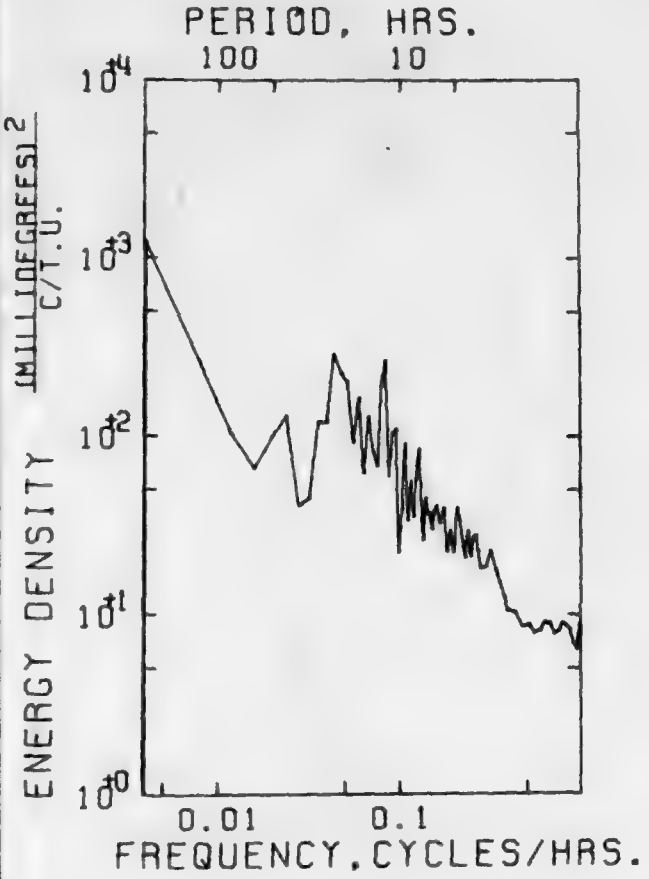
SPANNING RANGE
FROM 73- IV -03 07.00.34
TO 73- VI -28 18.30.34

DURATION 86 DAYS 11 H 30 M

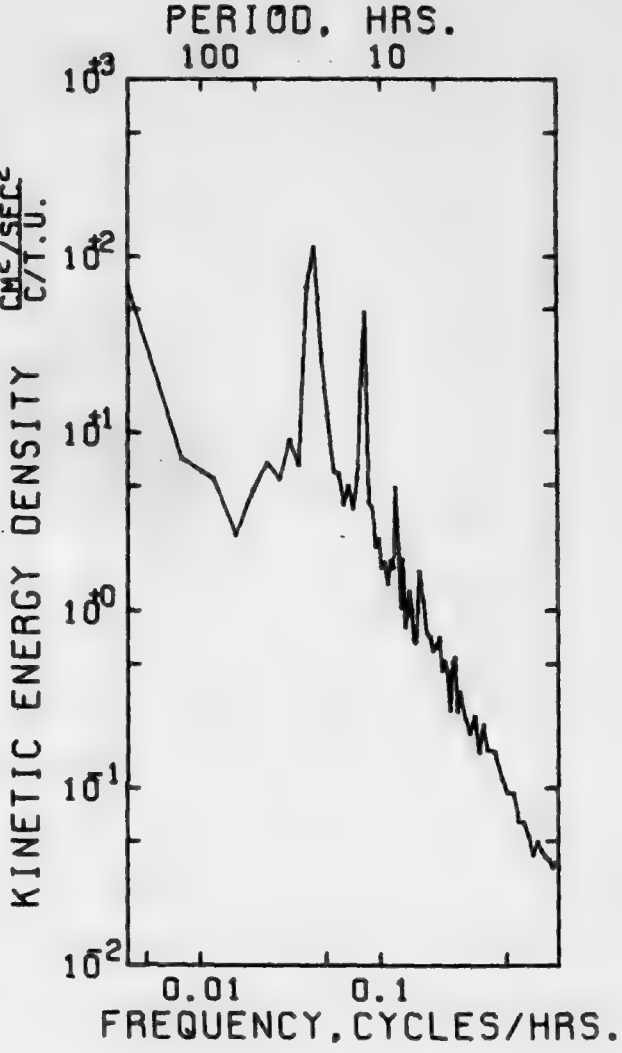
*** TEMPERATURE ***
*** DEGREES C. ***

MEAN =	2.345	STD ERR =	.000
VARIANCE =	.000		
STD. DEV. =	.011		
KURTOSIS =	2.100		
SKEWNESS =	.16		

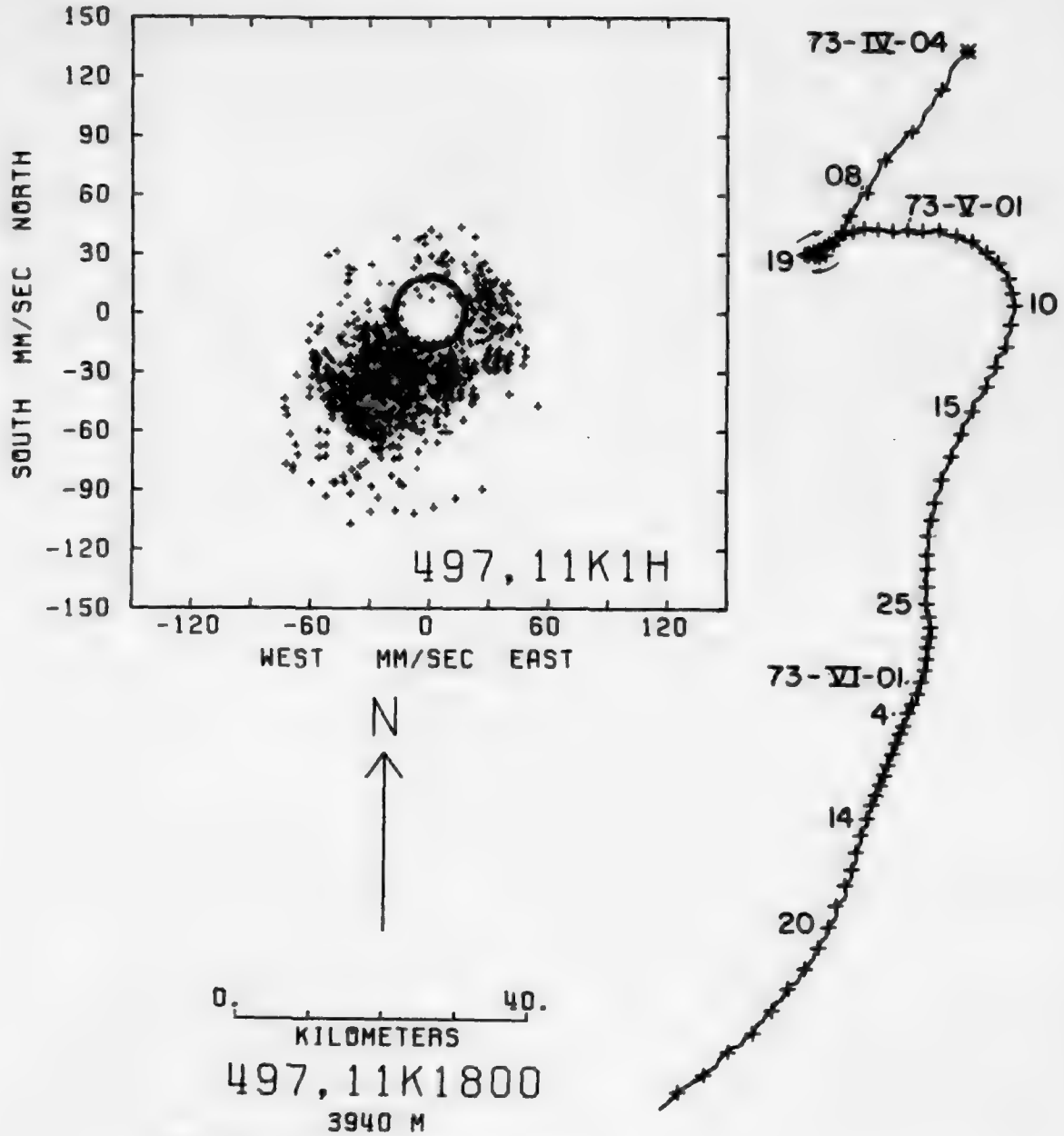
SAMPLE SIZE = 4152 POINTS



AUTO SPECTRUM
497.11K1800 TEMPERATURE
3940 METERS
73-IV-03 TO 73-VI-27
1 PIECES WITH 2048 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS



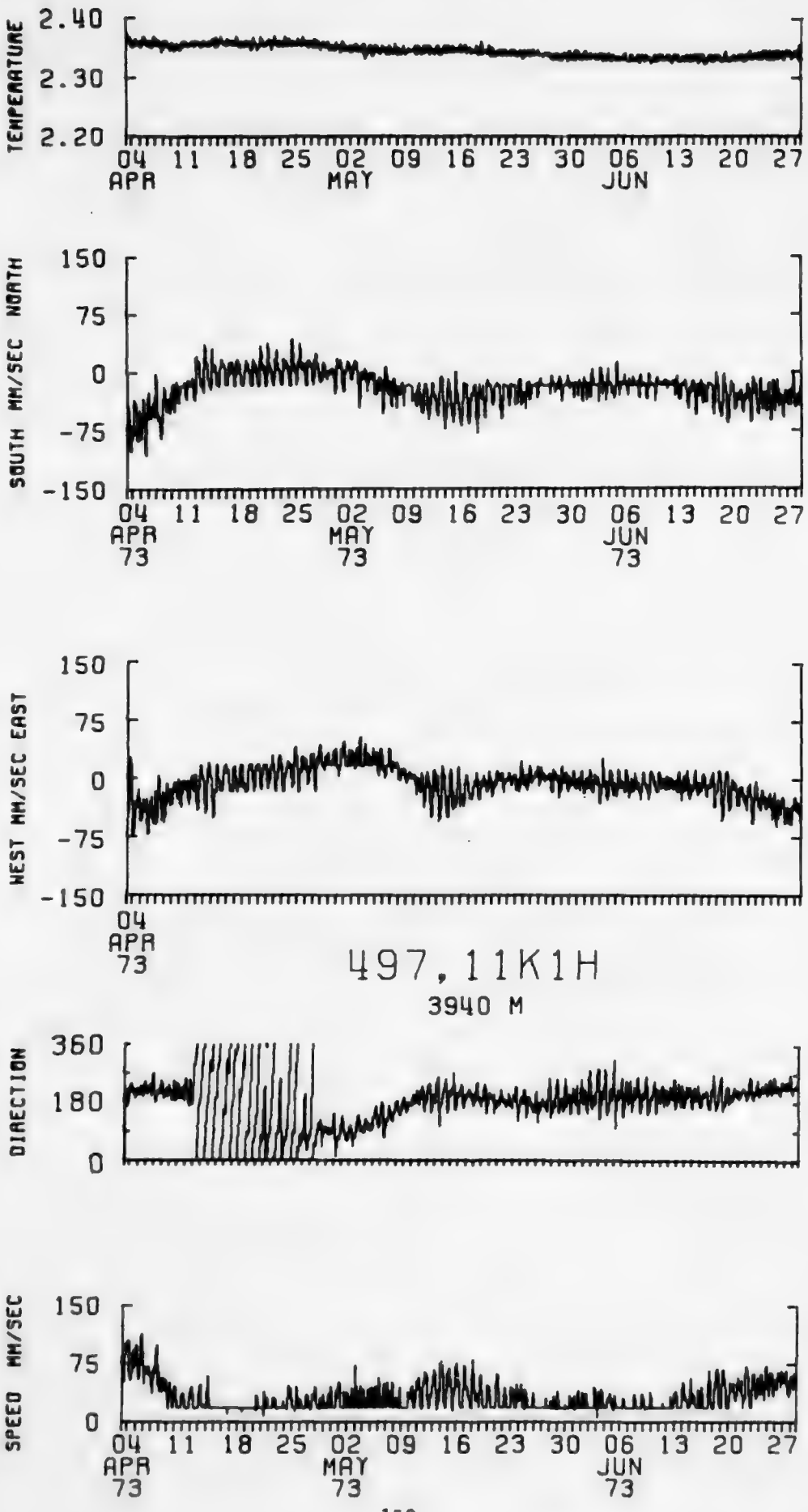
AUTO SPECTRUM
497.11K1800 EAST
497.11K1800 NORTH
3940 METERS
73-IV-03 TO 73-VI-27
1 PIECES WITH 2048 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS



497,11K1800

3940 M

73- IV -04 TO 73- VI -28


TEMPERATURE
2.40
2.30
2.20
04 11 18 25 02 09 16 23 30 06 13 20 27
APR
MAY
JUN
SOUTH MM/SEC NORTH
150
75
0
-75
-150
04 11 18 25 02 09 16 23 30 06 13 20 27
APR 73
MAY 73
JUN 73
WEST MM/SEC EAST
150
75
0
-75
-150
04
APR
73
497,11K1H
3940 M
DIRECTION
360
180
0
SPEED MM/SEC
150
75
0
04 11 18 25 02 09 16 23 30 06 13 20 27
APR 73
MAY 73
JUN 73

DATA NUMBER 497,13

Instrument No.: M-129t

Type: Magnetic Tape Recording Current Meter

Depth: 5182 m

Water depth: 5296 m

Start time: 73-April-02 20.00.34.

Stop time: 73-June-21 22.30.34.

Duration: 80d 2h 30m

Sampling scheme: Interval

time between strobes = 5.27 seconds

no. of strobes per interval = 13

recording interval = 1800 seconds

COMMENTS:

Compass - good

Vane - good

Rotor - data edited to correct for an electronic problem - results look good

Temperature - bad

STATS DATA/ 497.13G1800A

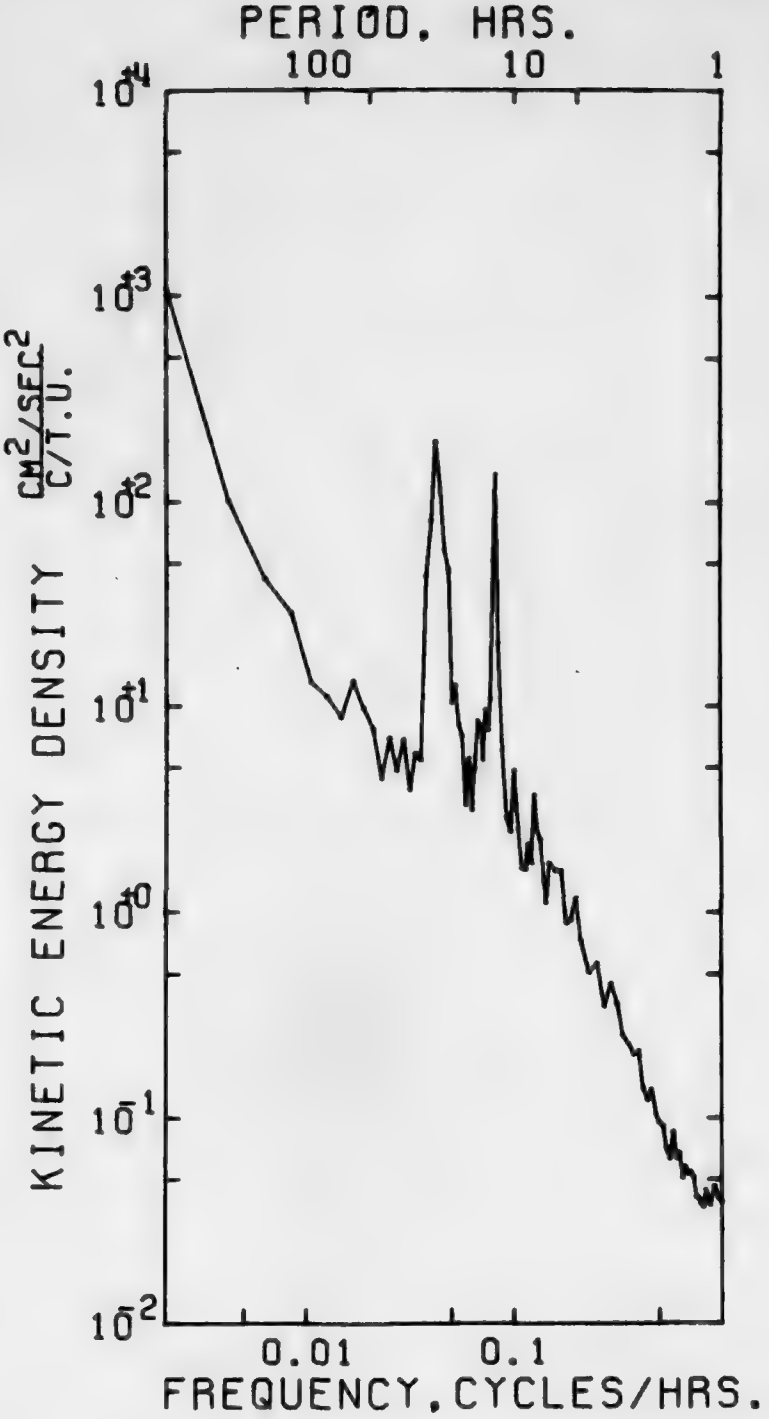
	EAST	NORTH	SPEED		EAST & NORTH	
MEAN =	26.16	3.82	41.84	COVARIANCE =		40.11
STD. ERR. =	.56	.28	.35	STD. ERR. OF COVARIANCE =		12.67
VARIANCE =	1209.29	307.82	459.40	STD. DEV. OF COVARIANCE =		785.82
STD. DEV. =	34.69	17.54	21.43	CORRELATION COEFFICIENT =		.086
KURTOSIS =	9.20	9.44	9.49	VECTOR MEAN =		28.44
SKEWNESS =	-.36	.17	.92	VECTOR VARIANCE =		755.58
				STD. DEV. =		27.49

UNITS OF RAW DATA VARIABLES = MM/SEC

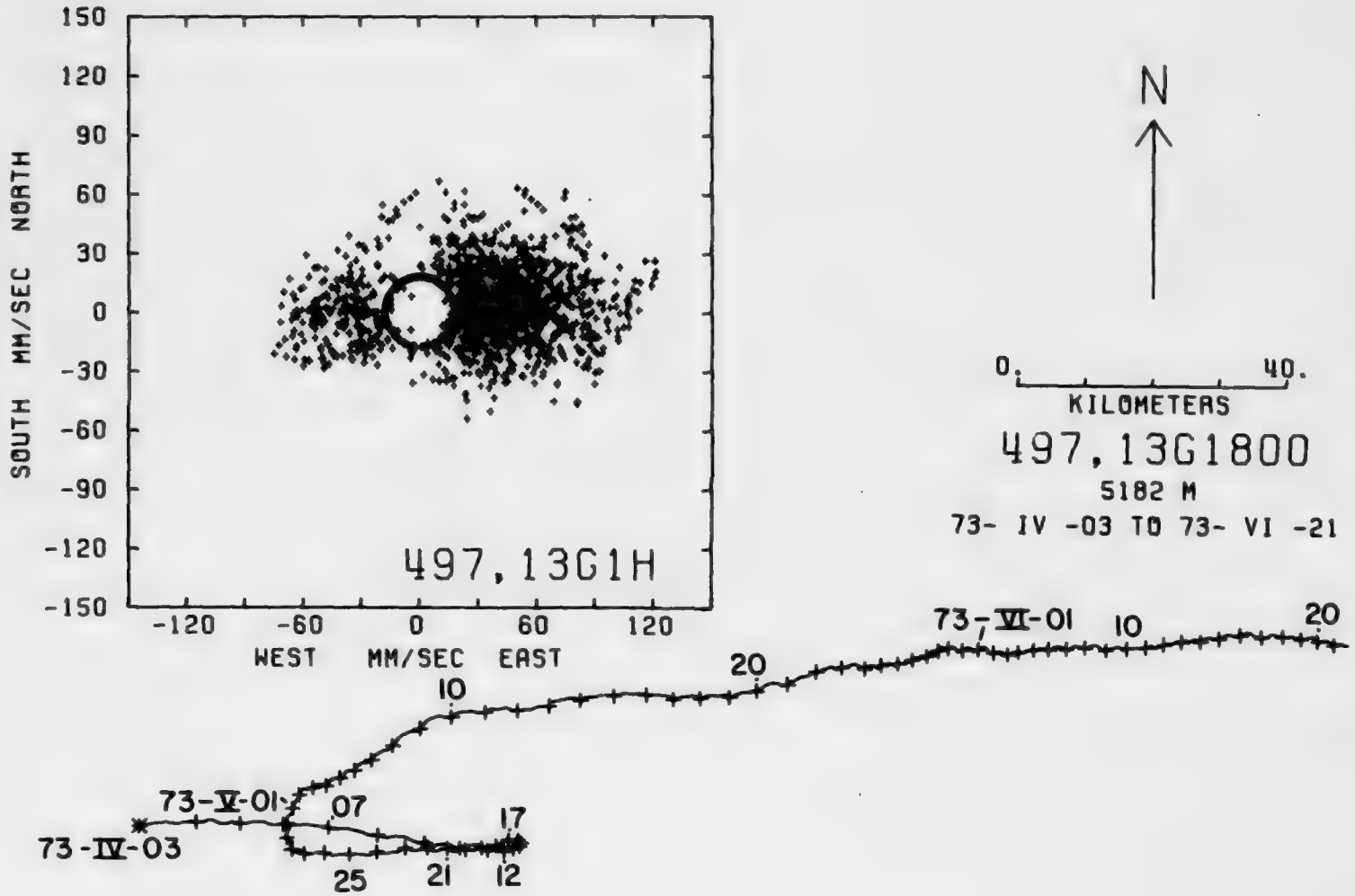
SAMPLE SIZE = 3846 POINTS

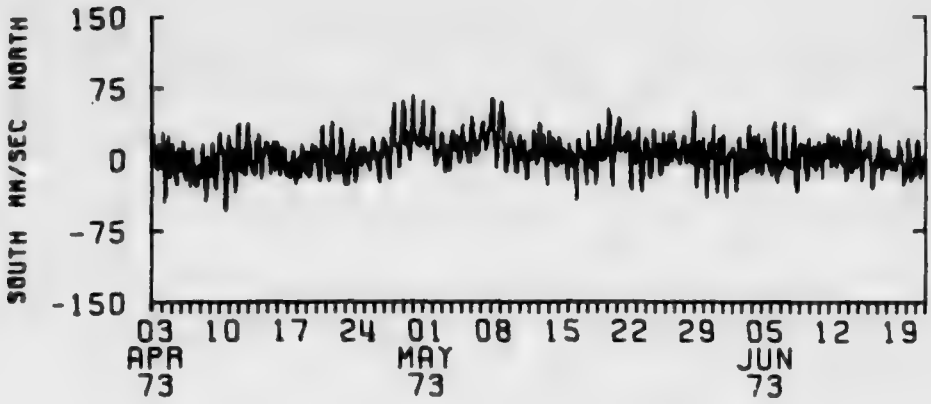
SPANNING RANGE
FROM 73- IV -02 20.00.34
TO 73- VI -21 22.30.34

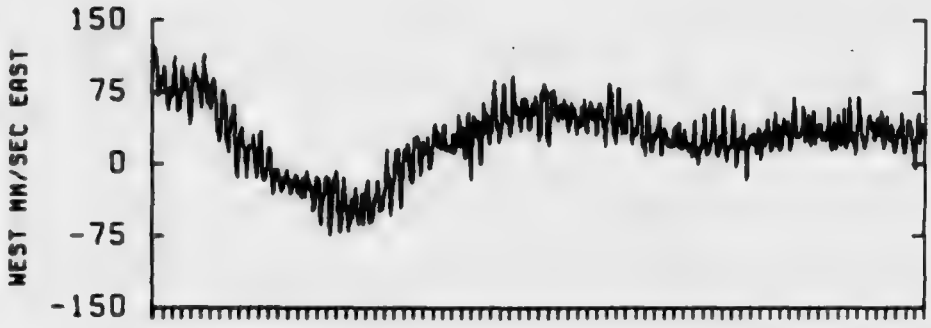
DURATION 80 DAYS 2 H 30 M 0 S



AUTO SPECTRUM
497.13G1800 EAST
497.13G1800 NORTH
5182 METERS
73-IV-02 TO 73-VI-21
1 PIECES WITH 1920 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS

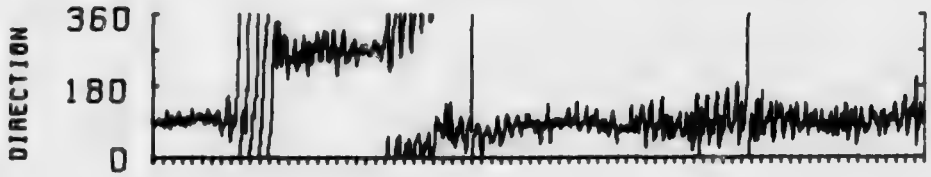

150
120
90
60
30
0
-30
-60
-90
-120
-150
SOUTH MM/SEC NORTH
-120
-60
0
60
120
WEST
MM/SEC
EAST
497,13G1H
N
0.
40.
KILOMETERS
497,13G1800
5182 M
73- IV -03 TO 73- VI -21
73-IV-03
73-V-01
73-VI-01
10
20
07
17
25
21
12

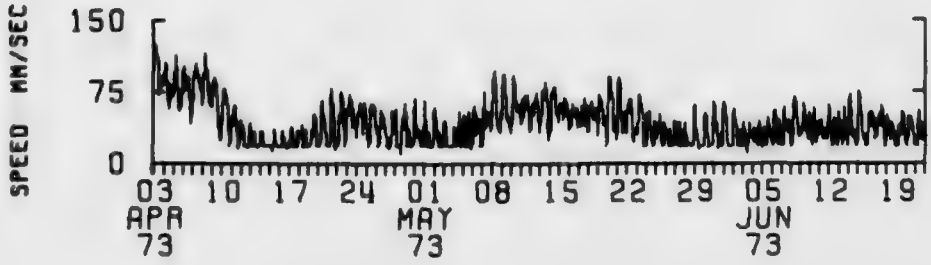




497,13G1H

5182 M





Mooring No. 498

Set 1973 April 3 (Year Month Day) — 27° 33.1'N (Latitude) — 69° 34.1'W (Longitude)

Set by J. Gifford - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 2

Retrieved 1973 June 28 (Year Month Day)

Retrieved by G. Tupper - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 6

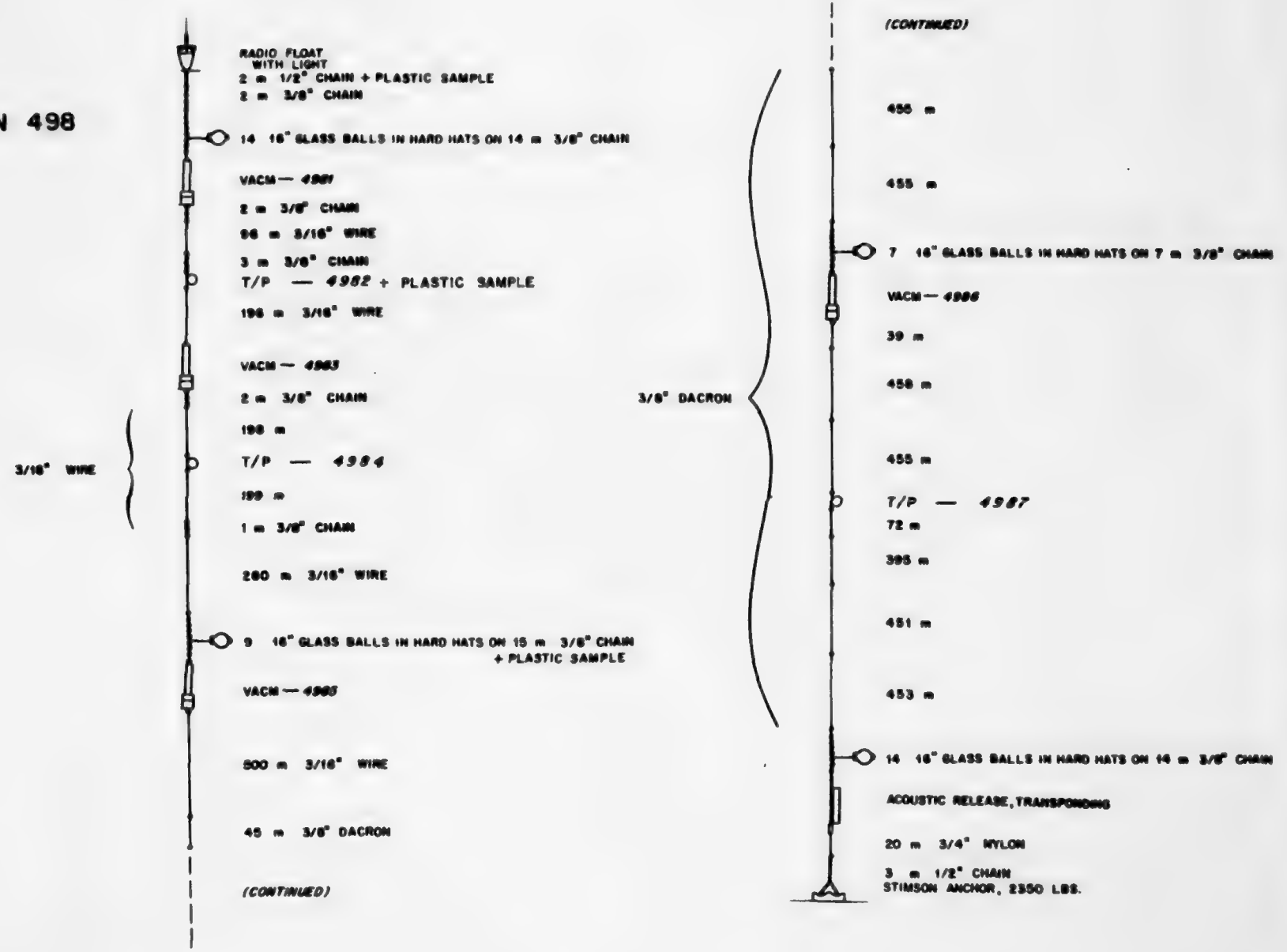
Purpose of Mooring: Mooring #4 of MODE 1 array

Mooring Type: Subsurface

Key	Data Number	Instrument Number	Type	Depth Meters	Comments
*	4981	V-0103	VACM	413	Built by EG&G (Geodyne)
#	4982	#36	T/P	513	M.I.T.
*	4983	V-0158	VACM	713	I.O.S.
#	4984	#49	T/P	914	M.I.T.
+	4985	V-0202	VACM	1414	
	4986	V-0198	VACM	2933	Flooded
#	4987	#23	T/P	3948	M.I.T.
	Water depth			5463	

COMMENTS ON MOORING:

STATION 498


RADIO FLOAT
WITH LIGHT
2 m 1/2" CHAIN + PLASTIC SAMPLE
2 m 3/8" CHAIN
14 16" GLASS BALLS IN HARD HATS ON 14 m 3/8" CHAIN
VACM — 4981
2 m 3/8" CHAIN
96 m 3/16" WIRE
3 m 3/8" CHAIN
T/P — 4982 + PLASTIC SAMPLE
198 m 3/16" WIRE
VACM — 4983
2 m 3/8" CHAIN
198 m
T/P — 4984
199 m
1 m 3/8" CHAIN
280 m 3/16" WIRE
9 16" GLASS BALLS IN HARD HATS ON 15 m 3/8" CHAIN
+ PLASTIC SAMPLE
VACM — 4985
500 m 3/16" WIRE
45 m 3/8" DACRON
(CONTINUED)
3/16" WIRE
3/8" DACRON
(CONTINUED)
456 m
455 m
7 16" GLASS BALLS IN HARD HATS ON 7 m 3/8" CHAIN
VACM — 4986
39 m
458 m
455 m
T/P — 4987
72 m
395 m
451 m
453 m
14 16" GLASS BALLS IN HARD HATS ON 14 m 3/8" CHAIN
ACOUSTIC RELEASE, TRANSPONDING
20 m 3/4" NYLON
3 m 1/2" CHAIN
STIMSON ANCHOR, 2350 LBS.

DATA NUMBER 4981

Instrument No.: V-0103 Type: Vector Averaging Current Meter

Depth: 413 m Water Depth: 5463 m

Start time: 73-April-03 09.07.30

Stop time: 73-June-28 08.52.30

Duration: 85d 23h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

A Geodyne model vector averaging current meter

Compass - good

Vane - good

Rotor - good

Temperature - good

The U and V components from 4983 do not agree with components from 4981. Yet both instruments seemed to have operated normally.

STATS DATA/ 4981J8008

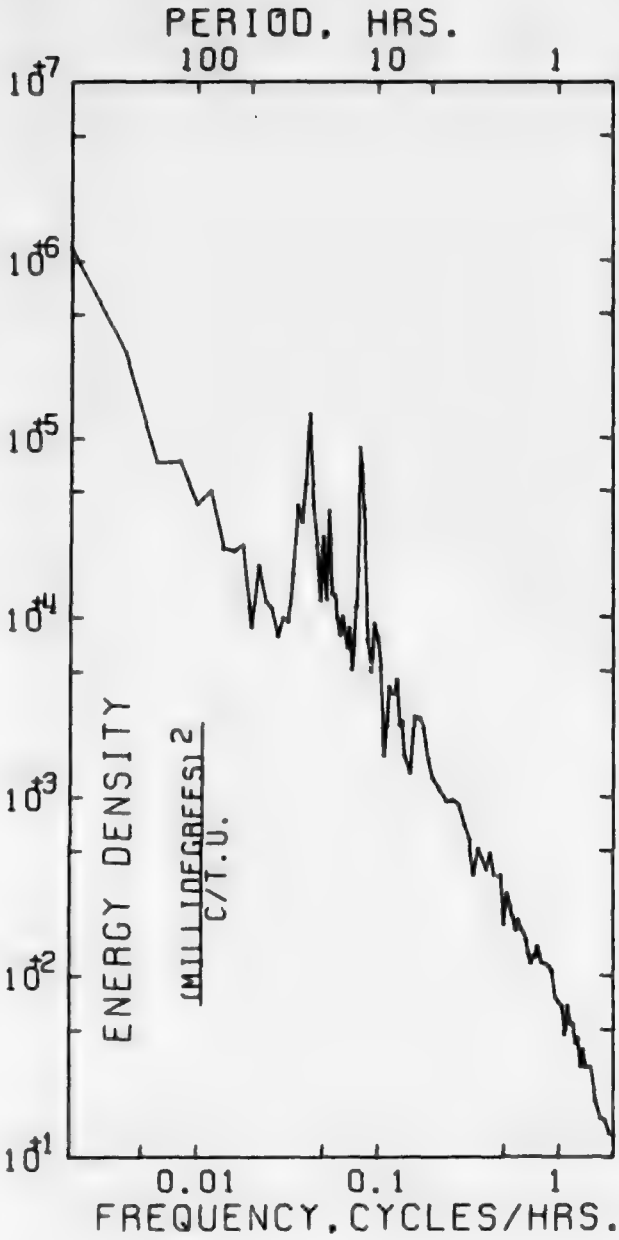
	EAST	NORTH	SPEED	***** EAST & NORTH *****
MEAN =	-17.74	-17.72	35.08	COVARIANCE = 333.71
STD. ERR. =	.46	.47	.61	STD. ERR. OF COVARIANCE = 28.82
VARIANCE =	1714.22	1822.21	3071.88	STD. DEV. OF COVARIANCE = 2600.85
STD. DEV. =	41.40	42.69	55.42	CORRELATION COEFFICIENT = .188
KURTOSIS =	3.83	3.89	2.52	VECTOR MEAN = 25.07
SKEWNESS =	-.70	-.98	.41	VECTOR VARIANCE = 1788.21
				STD. DEV. = 42.05

UNITS OF RAW DATA VARIABLES = MM/SEC

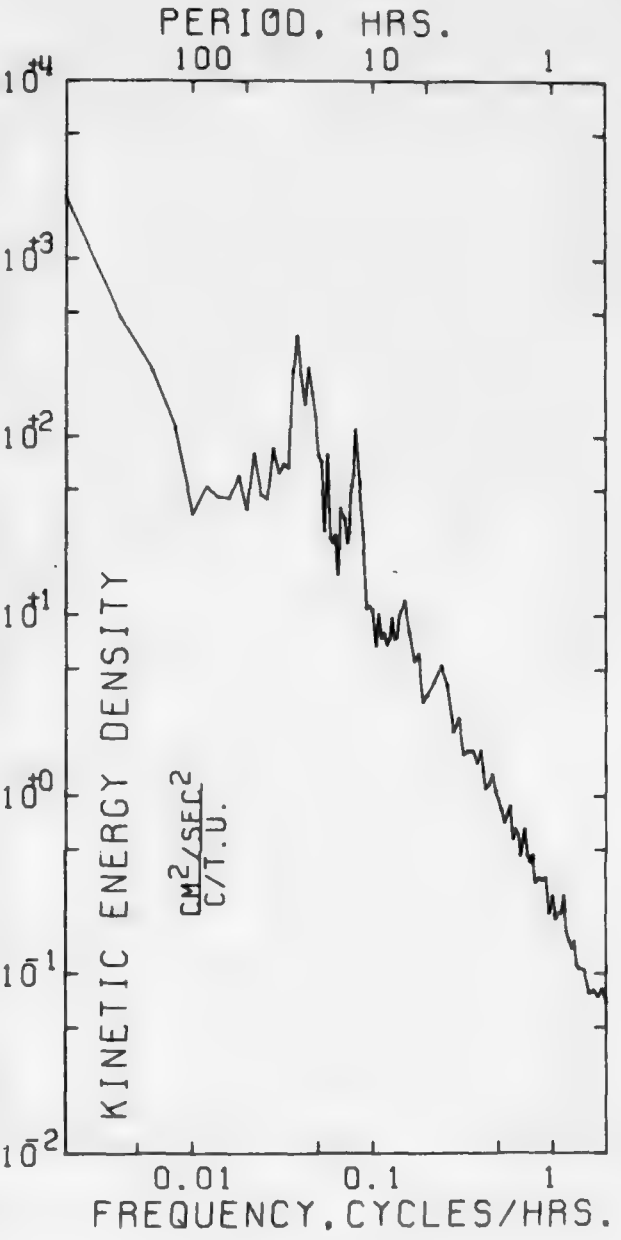
SAMPLE SIZE = 8258 POINTS

SPANNING RANGE
FROM 73- IV -03 09.07.30
TO 73- VI -28 08.52.30

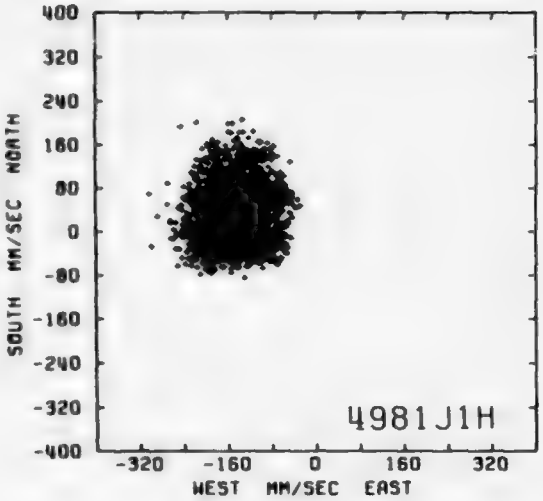
DURATION 85 DAYS 23 H 45 M 0 S

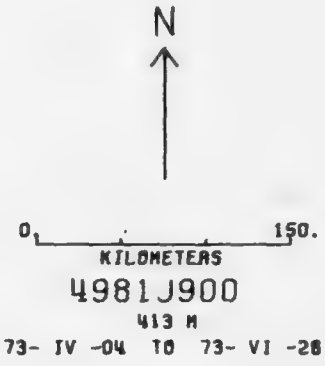


AUTO SPECTRUM
4981J900 TEMPERATURE
413 METERS
73-IV-03 TO 73-VI-25
1 PIECES WITH 4000 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
4981J900 EAST
4981J900 NORTH
413 METERS
73-IV-03 TO 73-VI-25
1 PIECES WITH 4000 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS

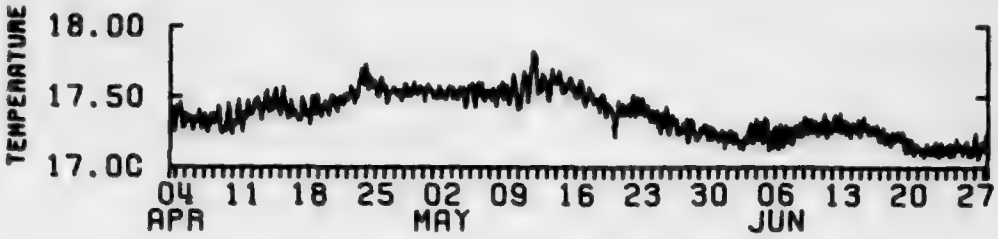


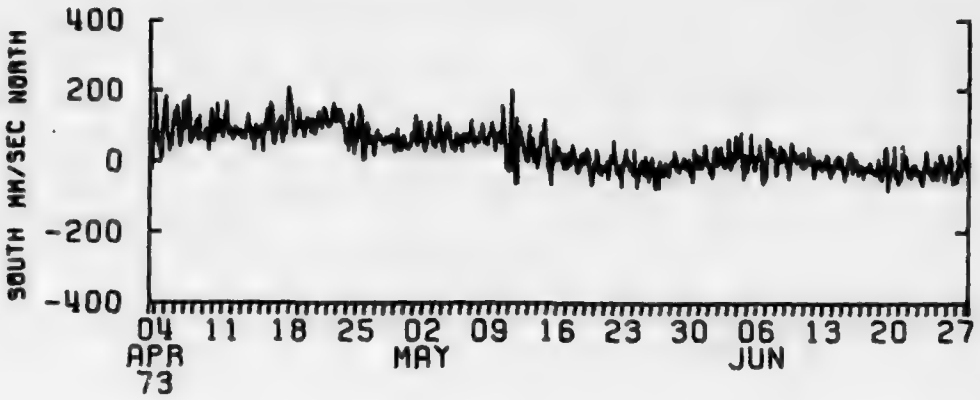


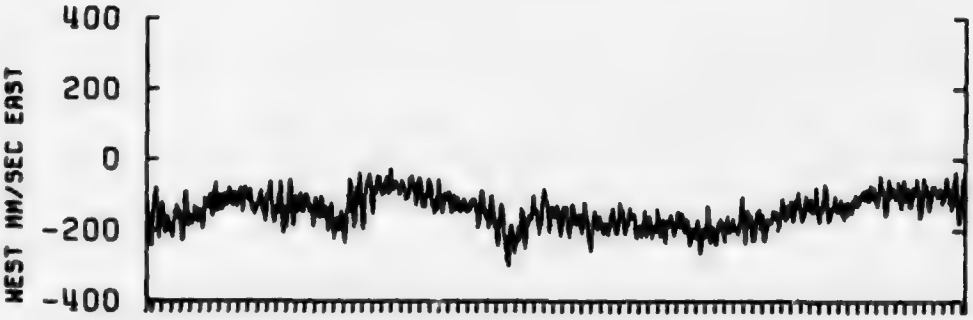
4981J900

413 M

73- IV -04 TO 73- VI -28

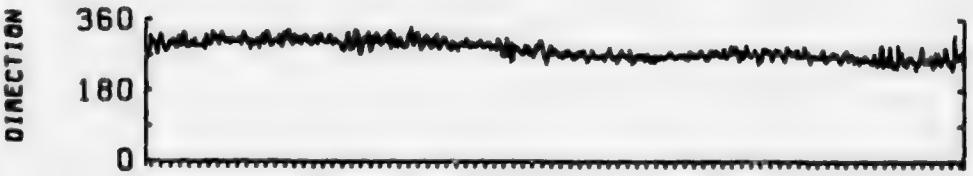


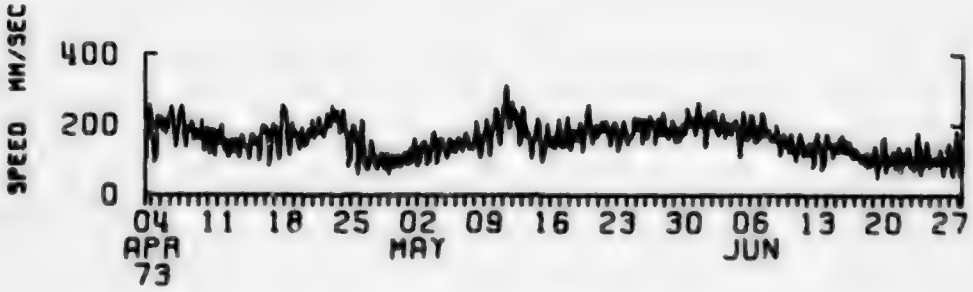




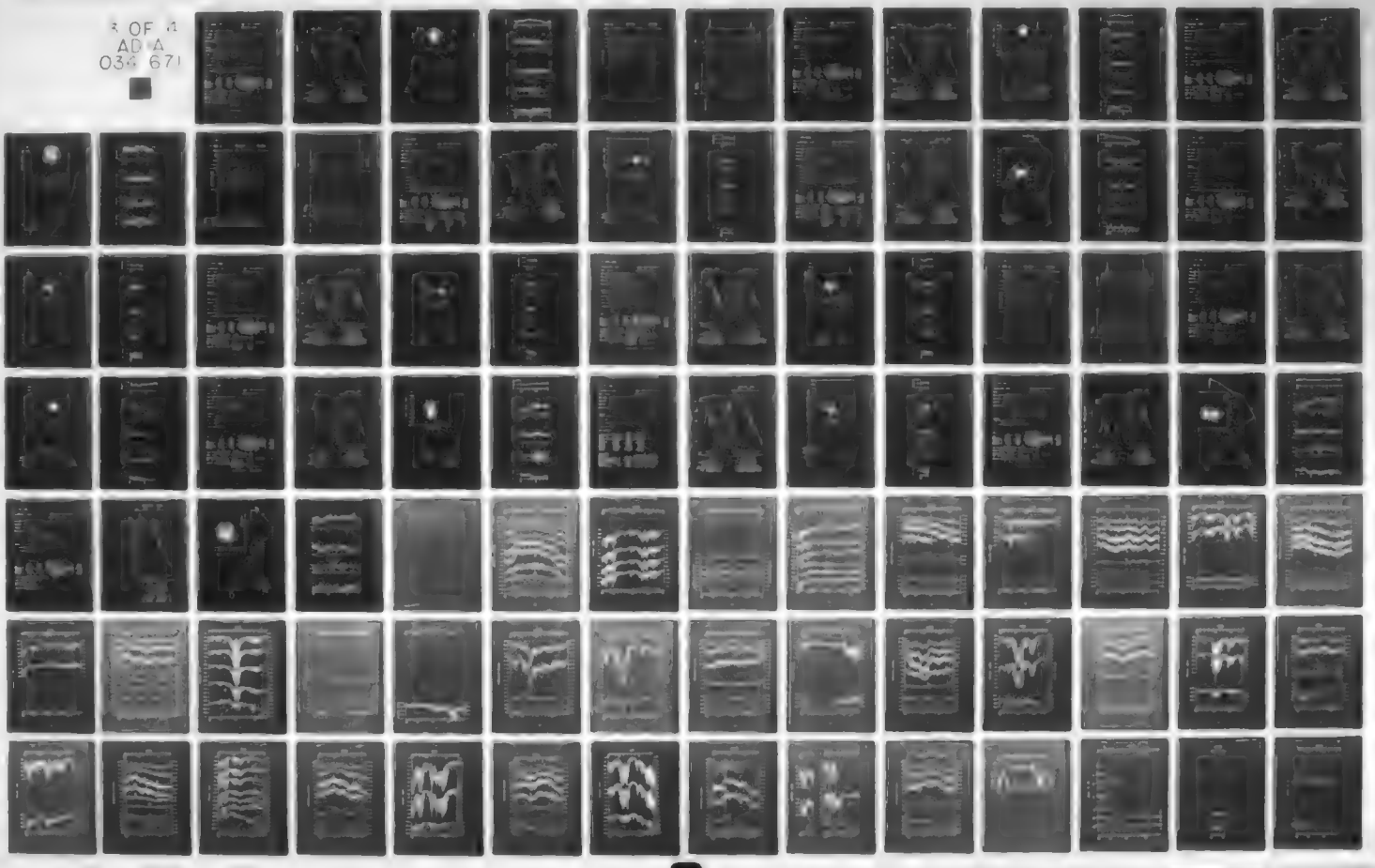
4981J1H

413 M





AD-A034 671 WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS F/G 8/3
A COMPILATION OF MOORED CURRENT DATA AND ASSOCIATED OCEANOGRAPH--ETC(U)
NOV 76 D CHAUSSE, S TARBELL N00014-66-C-0241
UNCLASSIFIED WHOI-76-101 NL



DATA NUMBER 4983

Instrument No.: V-0158 Type: Vector Averaging Current Meter

Depth: 713 m Water Depth: 5463 m

Start time: 73-April-03 09.07.30.

Stop time: 73-June-07 23.52.30.

Duration: 65d 14h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

Instrument belongs to National Institute of Oceanography now known as Institute of Oceanographic Sciences

Compass - good

Vane - stuck June 8 to end

Rotor - good

Temperature - good

The U and V components from 4981 do not agree with components from 4983. Yet both instruments seemed to have operated normally.

STATS DATA/ 498309008

	EAST	NORTH	SPEED		EAST & NORTH	
MEAN =	-80.73	-36.88	119.75	# COVARIANCE =		-429.46
STD. ERR. =	.81	.81	.55	# STD. ERR. OF COVARIANCE =		78.18
VARIANCE =	2370.78	4142.86	1788.74	# STD. DEV. OF COVARIANCE =		8284.88
STD. DEV. =	48.69	64.37	42.09	# CORRELATION COEFFICIENT =		-.137
KURTOSIS =	3.84	2.47	2.94	# VECTOR MEAN =		87.84
SKEWNESS =	.31	-.01	.00	# VECTOR VARIANCE =		3258.87
				# STD. DEV. =		57.07

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 6300 POINTS

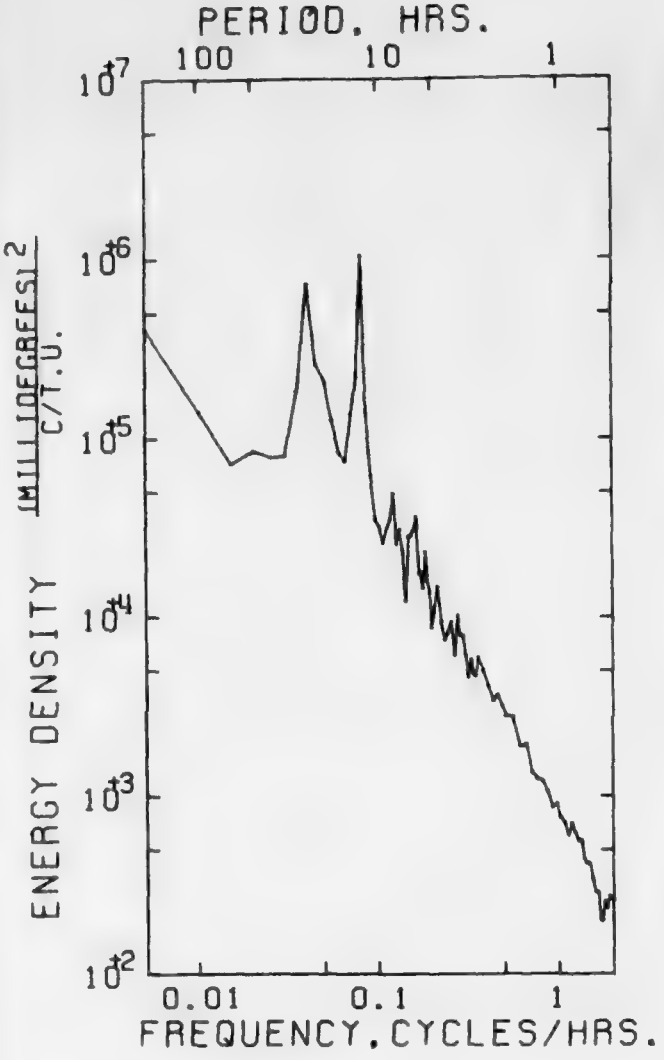
SPANNING RANGE
FROM 73- IV -03 09.07.30
TO 73- VI -07 23.52.30

DURATION 65 DAYS 14 H 45 M

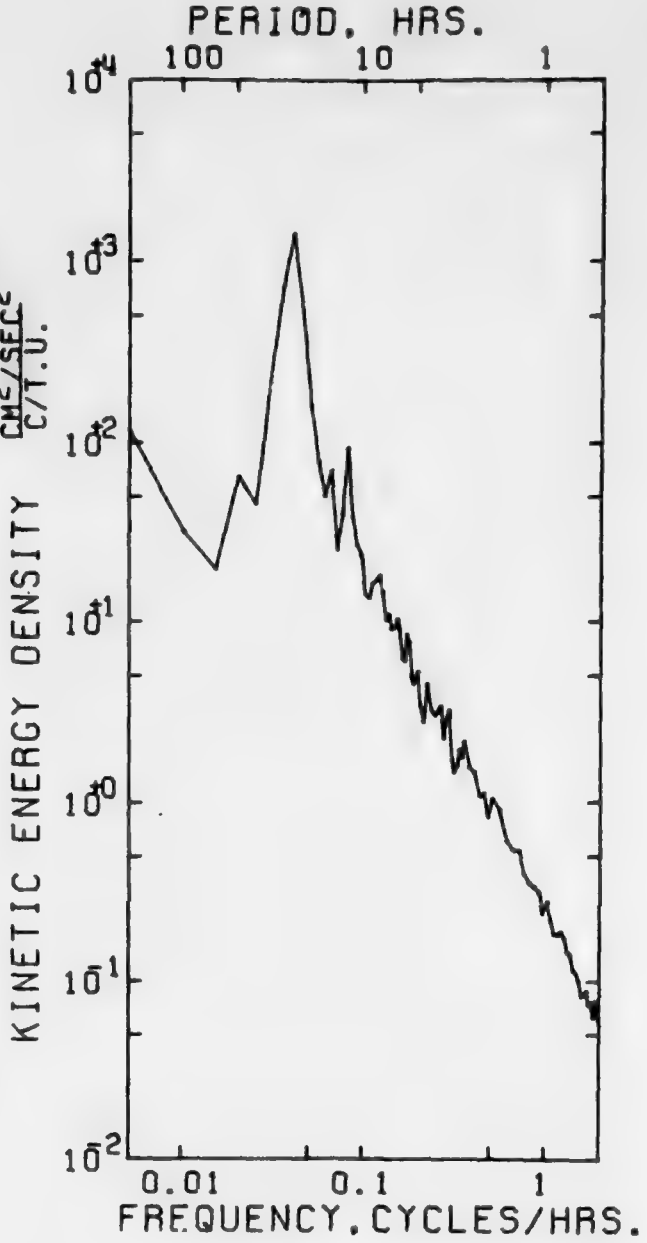
*** TEMPERATURE ***
*** DEGREES C. ***

MEAN = 12.761 STD ERR = .004
VARIANCE = .125
STD. DEV. = .354
KURTOSIS = 2.289
SKEWNESS = -.313

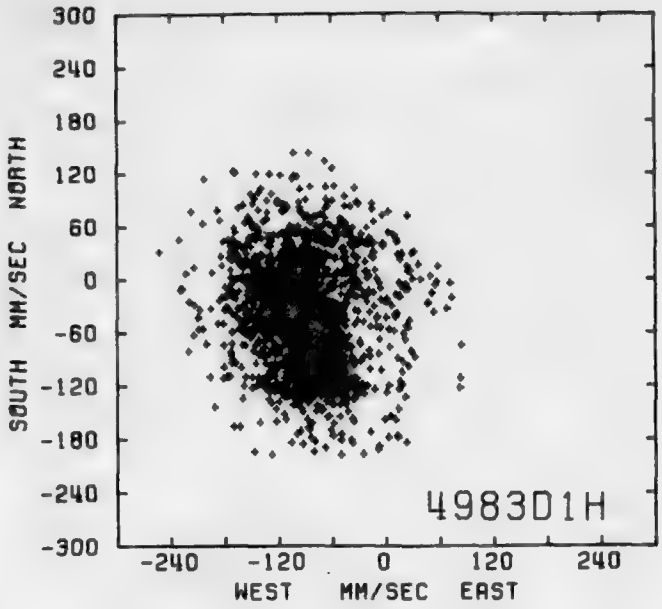
SAMPLE SIZE = 6300 POINTS

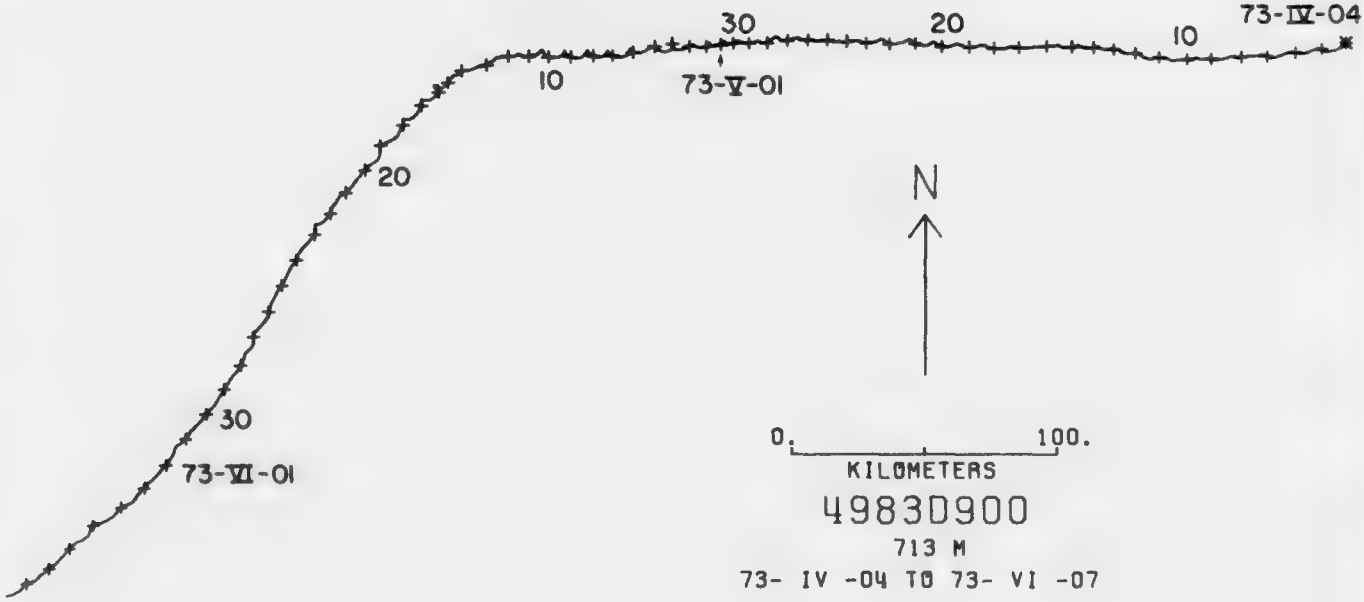


AUTO SPECTRUM
49830900 TEMPERATURE
713 METERS
73-IV-03 TO 73-VI-07
1 PIECES WITH 3125 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
49830900 EAST
49830900 NORTH
713 METERS
73-IV-03 TO 73-VI-07
1 PIECES WITH 3125 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS

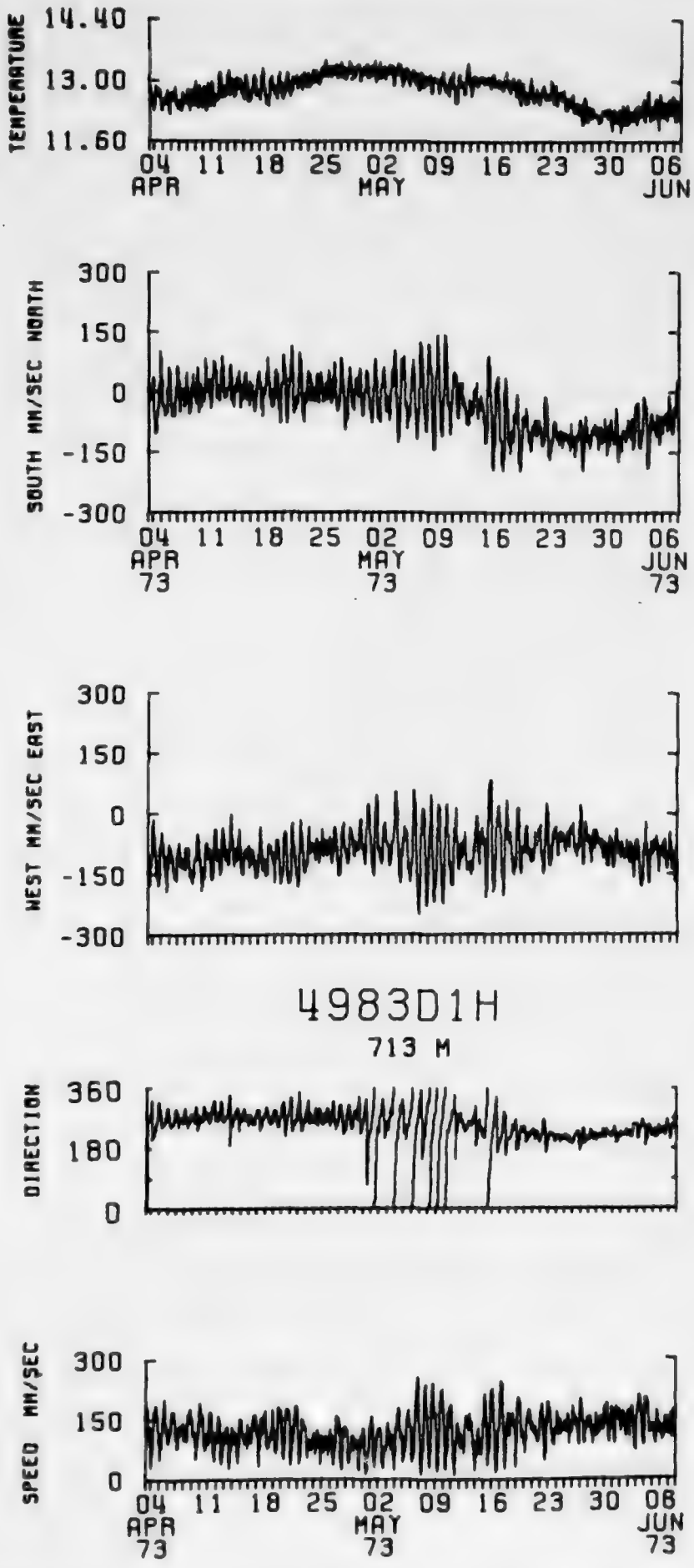




49830900

713 M

73- IV -04 TO 73- VI -07


TEMPERATURE
14.40
13.00
11.60
04 11 18 25 02 09 16 23 30 06
APR
MAY
JUN
SOUTH MM/SEC NORTH
300
150
0
-150
-300
04 11 18 25 02 09 16 23 30 06
APR 73
MAY 73
JUN 73
WEST MM/SEC EAST
300
150
0
-150
-300
4983D1H
713 M
DIRECTION
360
180
0
SPEED MM/SEC
300
150
0
04 11 18 25 02 09 16 23 30 06
APR 73
MAY 73
JUN 73

Mooring No. 499

Set 1973 April 3 (Year Month Day) 28° 08.9'N (Latitude) 70° 08.1'W (Longitude)

Set by G. Tupper - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 2

Retrieved 1973 June 28 (Year Month Day)

Retrieved by J. Gifford - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 6

Purpose of Mooring: Mooring #3 of MODE 1 array

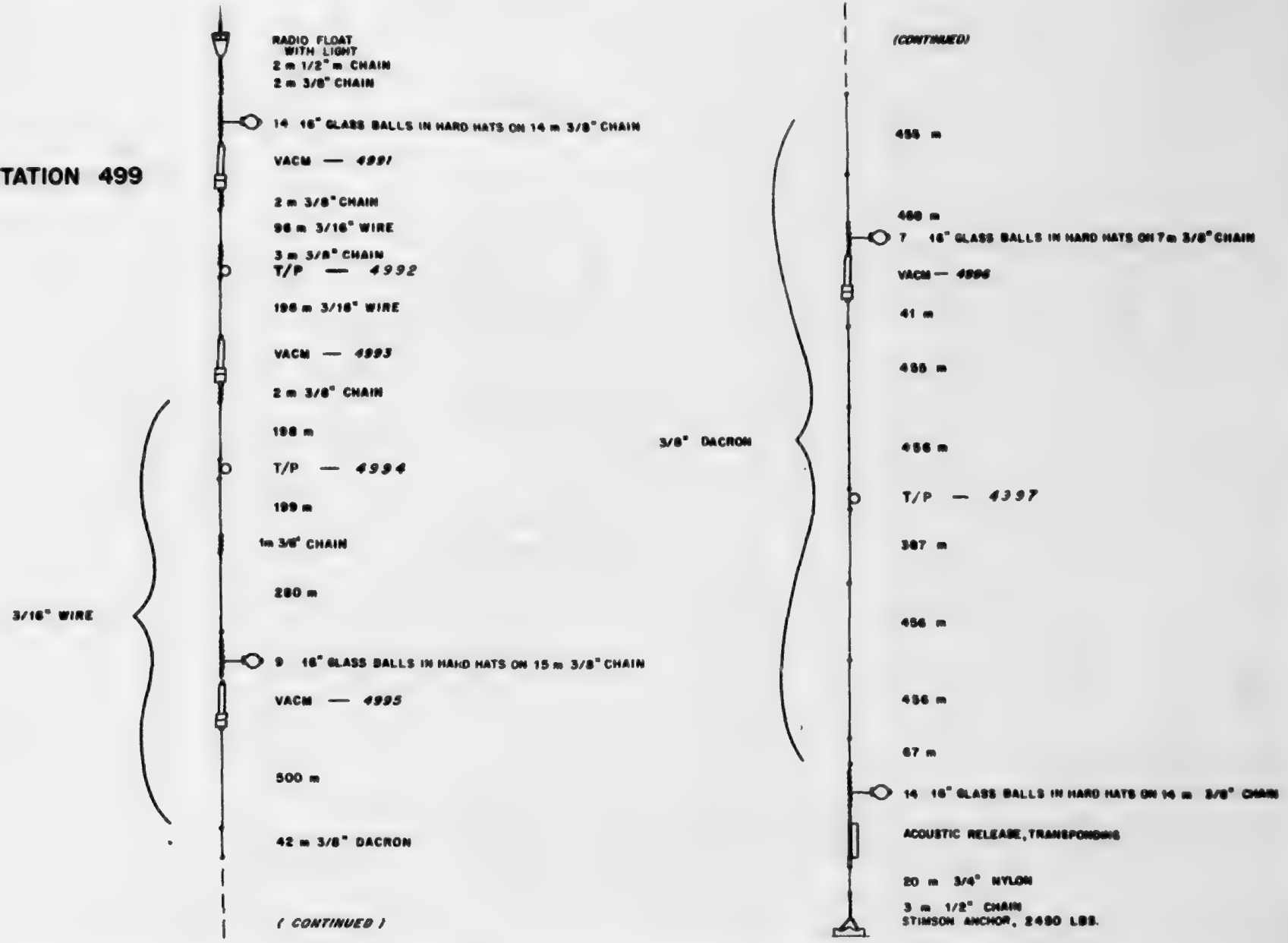
Mooring Type: Subsurface

Key	Data Number	Instrument Number	Type	Depth Meters	Comments
*	4991	V-0193	VACM	427	
#	4992	#14	T/P	531	M.I.T.
*	4993	V-0159	VACM	728	I.O.S.
#	4994	#48	T/P	933	M.I.T.
+	4995	V-0205	VACM	1428	
	4996	V-0102	VACM	2945	Built by EG&G (Geodyne)
#	4997	#22	T/P	3956	M.I.T.
	Water depth			5461	

COMMENTS ON MOORING:

Water soluble tape used on rotor and vanes of current meters. Shark watched recovery.

STATION 499


RADIO FLOAT
WITH LIGHT
2 m 1/2" m CHAIN
2 m 3/8" CHAIN
14 16" GLASS BALLS IN HARD HATS ON 14 m 3/8" CHAIN
VACM — 4991
2 m 3/8" CHAIN
96 m 3/16" WIRE
3 m 3/8" CHAIN
T/P — 4992
196 m 3/16" WIRE
VACM — 4993
2 m 3/8" CHAIN
198 m
T/P — 4994
199 m
1m 3/8" CHAIN
280 m
3/16" WIRE
9 16" GLASS BALLS IN HARD HATS ON 15 m 3/8" CHAIN
VACM — 4995
500 m
42 m 3/8" DACRON
(CONTINUED)
(CONTINUED)
455 m
460 m
7 16" GLASS BALLS IN HARD HATS ON 7 m 3/8" CHAIN
VACM — 4996
41 m
455 m
3/8" DACRON
456 m
T/P — 4997
387 m
456 m
456 m
67 m
14 16" GLASS BALLS IN HARD HATS ON 14 m 3/8" CHAIN
ACOUSTIC RELEASE, TRANSPONDING
20 m 3/4" NYLON
3 m 1/2" CHAIN
STIMSON ANCHOR, 2490 LBS.

DATA NUMBER 4991

Instrument No.: V-0193 Type: Vector Averaging Current Meter

Depth: 427 m Water Depth: 5461 m

Start time: 73-April-03 22.07.30.

Stop time: 73-May-16 23.52.30.

Duration: 43d 1h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:
Compass - good

Vane - good

Rotor - below threshold May 17 to May 22

Temperature - good

STATS DATA/ 4991E900A

	EAST	NORTH	SPEED	***** EAST & NORTH	*****
MEAN =	86.66	120.59	165.10	COVARIANCE =	-80.38
STD. ERR. =	.61	.75	.67	STD. ERR. OF COVARIANCE =	102.43
VARIANCE =	1532.69	2310.75	1849.50	STD. DEV. OF COVARIANCE =	8587.73
STD. DEV. =	39.15	48.16	43.01	CORRELATION COEFFICIENT =	-.043
KURTOSIS =	2.65	2.40	2.44	VECTOR MEAN =	148.50
SKEWNESS =	-.05	.14	.28	VECTOR VARIANCE =	1928.19
				STD. DEV. =	43.89

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 4136 POINTS

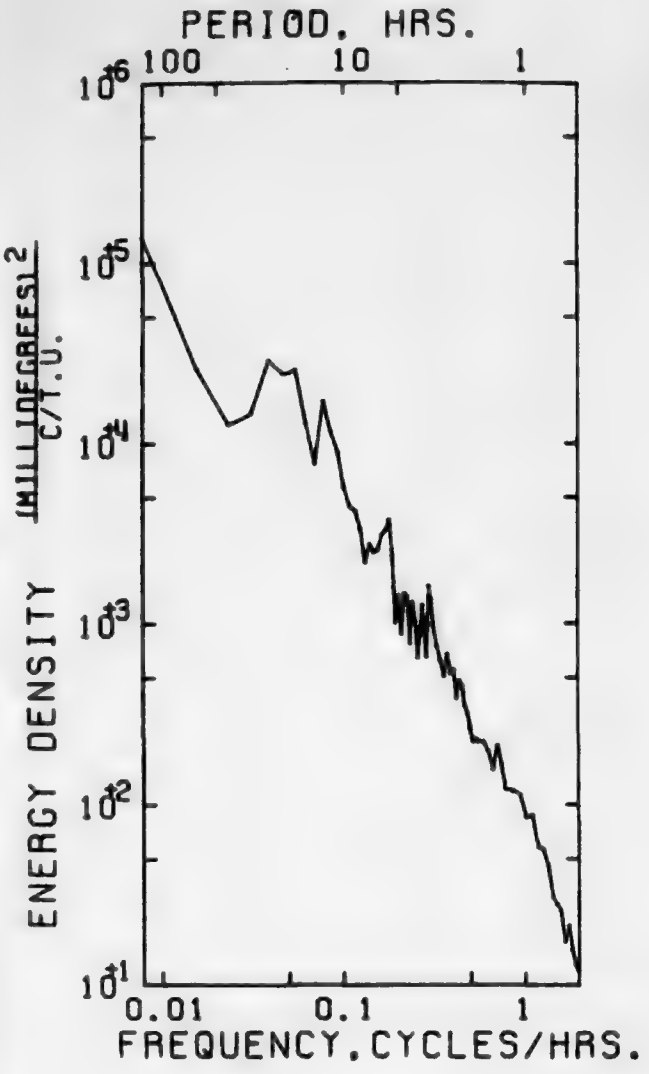
SPANNING RANGE
FROM 73- IV -03 22.07.30
TO 73- V -16 23.52.30

DURATION 43 DAYS 1 H 45 M

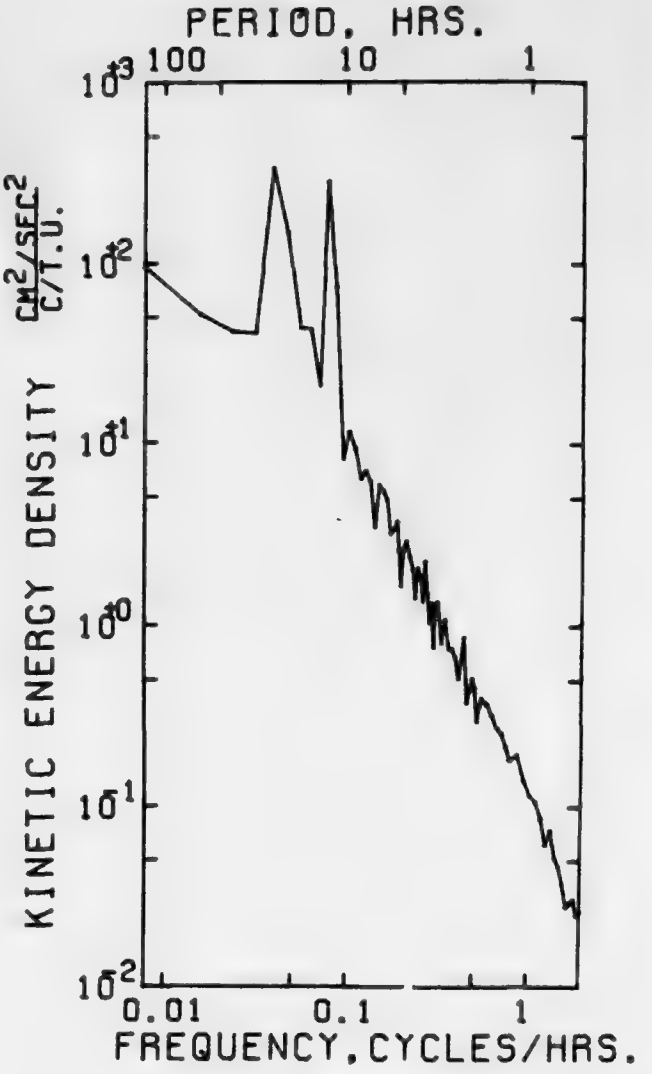
*** TEMPERATURE ***
*** DEGREES C. ***

MEAN =	17•307	STD ERR =	•001
VARIANCE =	•006		
STD. DEV. =	•078		
KURTOSIS =	2•397		
SKEWNESS =	-•163		

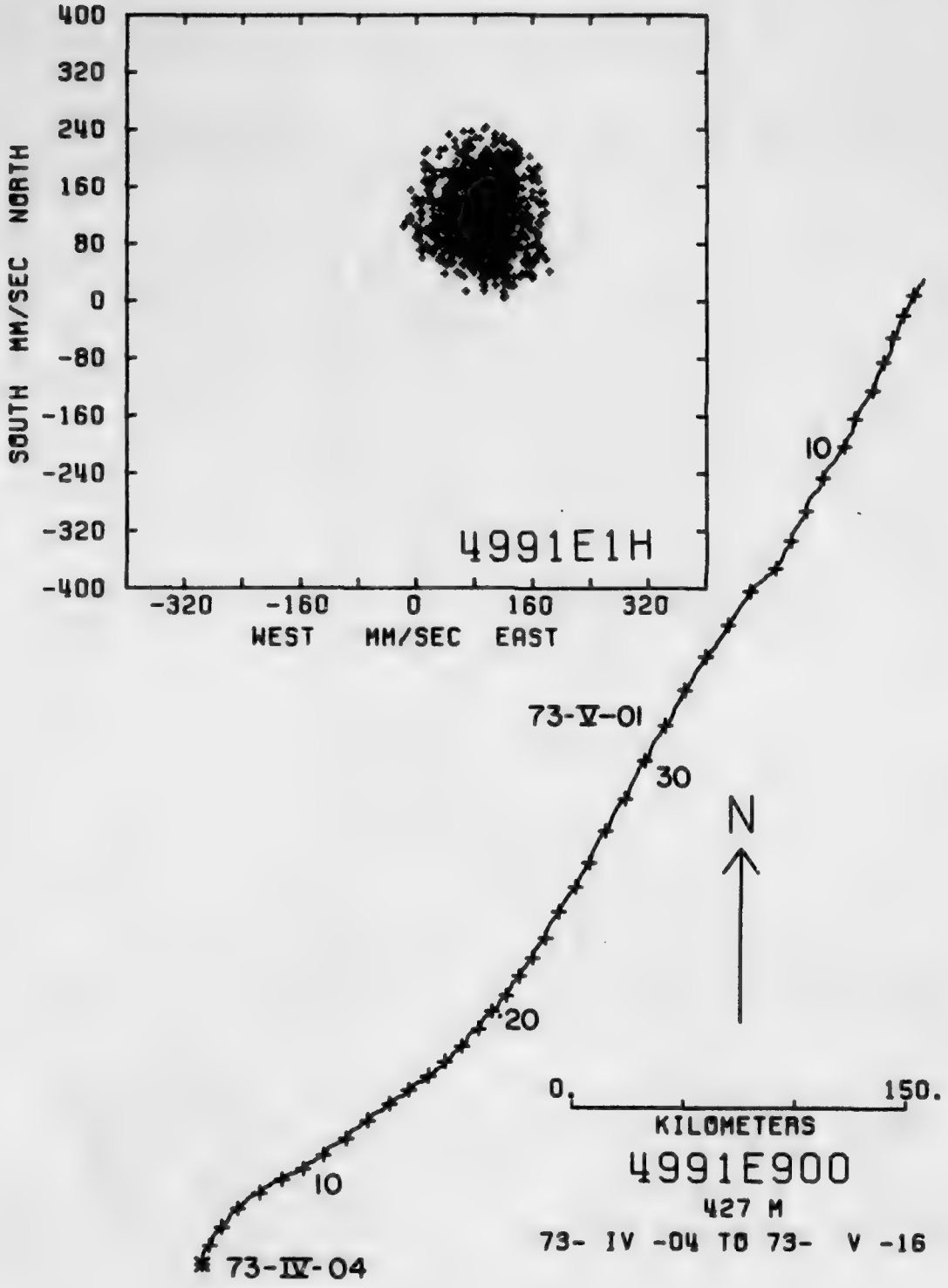
SAMPLE SIZE = 4136 POINTS

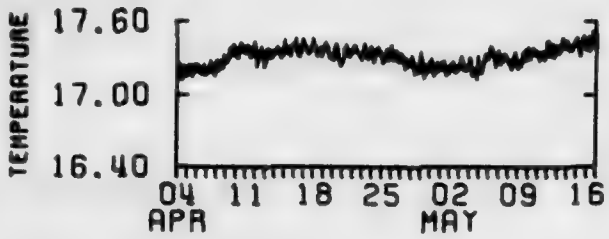


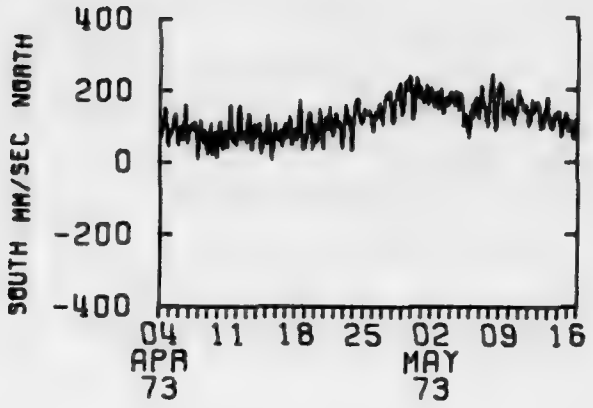
AUTO SPECTRUM
4991E900 TEMPERATURE
427 METERS
73-IV-03 TO 73-V-15
1 PIECES WITH 2048 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS

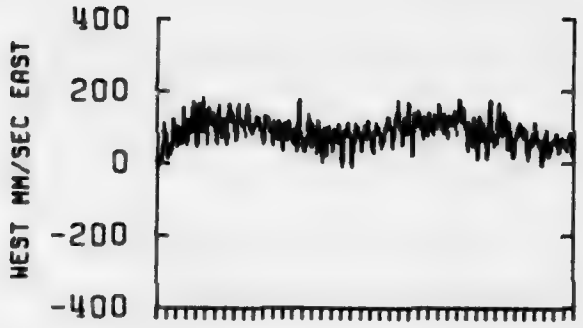


AUTO SPECTRUM
4991E900 EAST
4991E900 NORTH
427 METERS
73-IV-03 TO 73-V-16
1 PIECES WITH 2048 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS


400
320
240
160
80
0
-80
-160
-240
-320
-400
SOUTH MM/SEC NORTH
4991E1H
-320
-160
0
160
320
WEST MM/SEC EAST
10
73-V-01
30
N
20
0.
150.
KILOMETERS
4991E900
427 M
73- IV -04 TO 73- V -16
10
73-IV-04

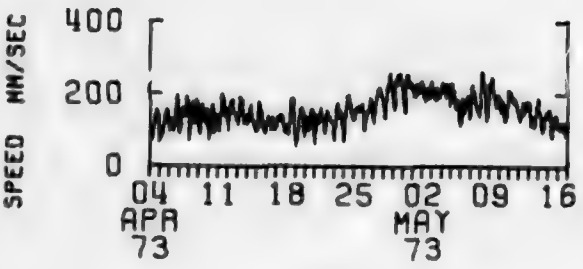






4991E1H

427 M



DATA NUMBER 4993

Instrument No.: V-0159 Type: Vector Averaging Current Meter

Depth: 728 m Water Depth: 5461 m

Start time: 73-April-04 01.07.30.

Stop time: 73-May-24 23.52.30.

Duration: 50d 22h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:
Instrument owned by Institute of Oceanographic Sciences

Compass - good

Vane - good

Rotor - below threshold May 25, 26, suspicious behavior June 18 to recovery

Temperature - good

STATS DATA/ 49938900A

	EAST	NORTH	SPEED	******	EAST & NORTH	******
MEAN =	39.00	75.16	102.54	* COVARIANCE =		-174.82
STD. ERR. =	.74	.88	.71	* STD. ERR. OF COVARIANCE =		75.48
VARIANCE =	2844.78	3570.92	2447.89	* STD. DEV. OF COVARIANCE =		5278.21
STD. DEV. =	51.43	59.83	48.47	* CORRELATION COEFFICIENT =		-.057
KURTOSIS =	2.44	2.49	2.42	* VECTOR MEAN =		82.08
SKEWNESS =	.04	.15	.37	* VECTOR VARIANCE =		9112.95
				* STD. DEV. =		55.78

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 4892 POINTS

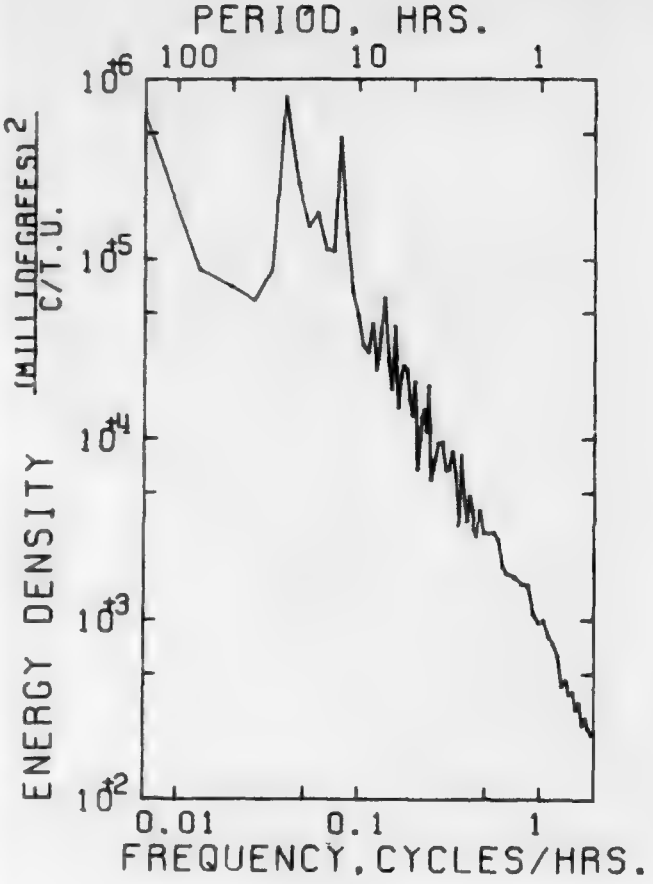
SPANNING RANGE
FROM 73- IV -04 01.07.30
TO 73- V -24 23.52.30

DURATION 50 DAYS 22 H 45 M

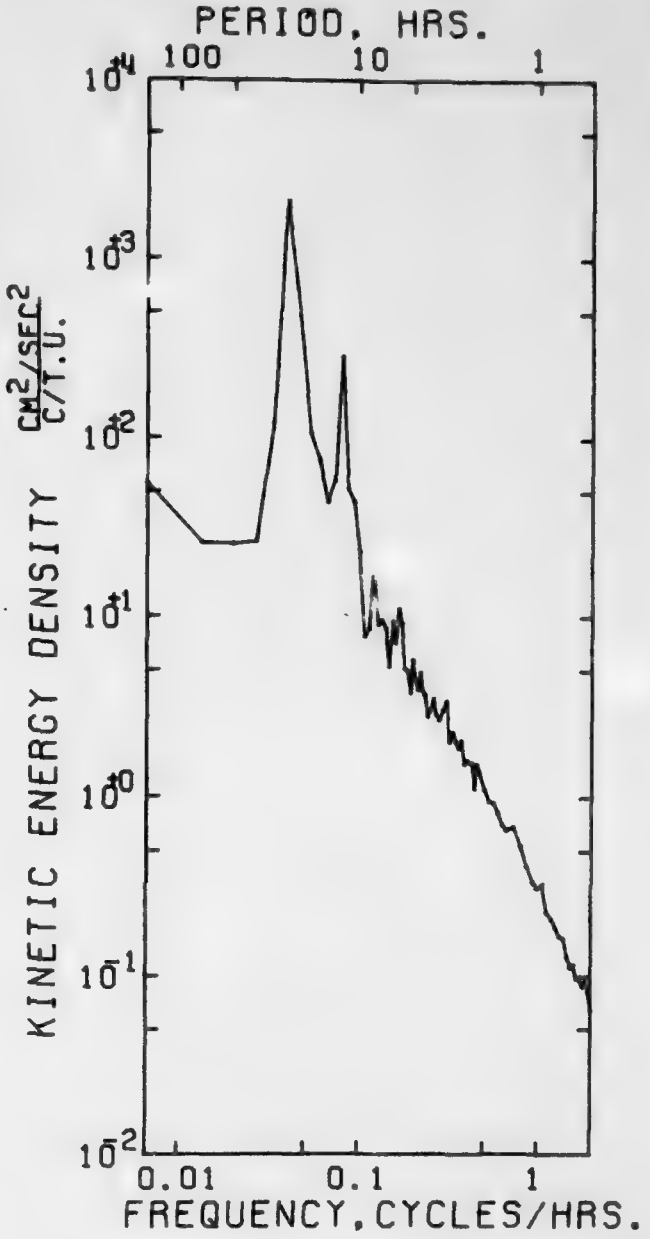
*** TEMPERATURE ***
*** DEGREES C. ***

MEAN =	12.407	STD ERR =	.004
VARIANCE =	.071		
STD. DEV. =	.267		
KURTOSIS =	3.076		
SKEWNESS =	.272		

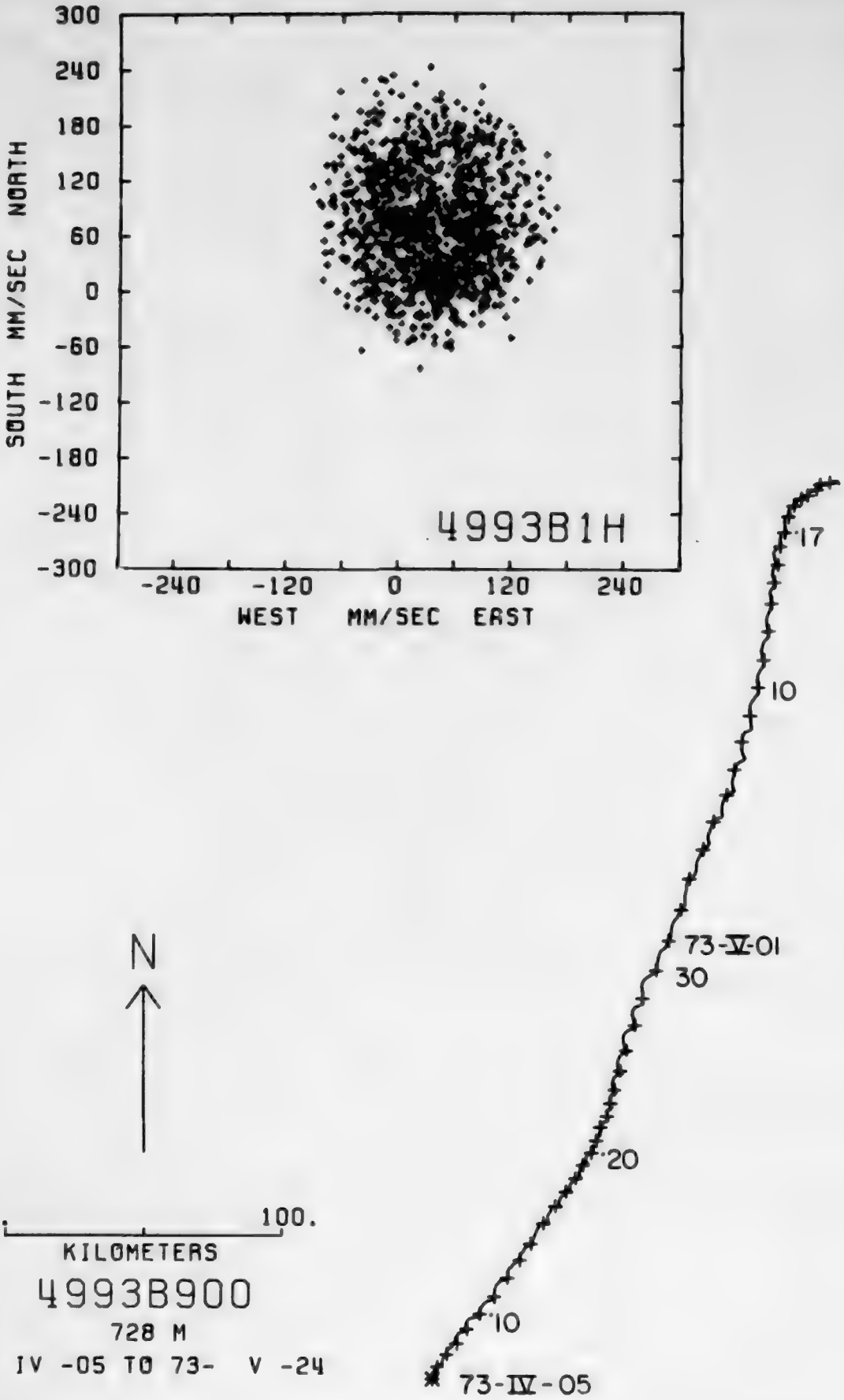
SAMPLE SIZE = 4892 POINTS

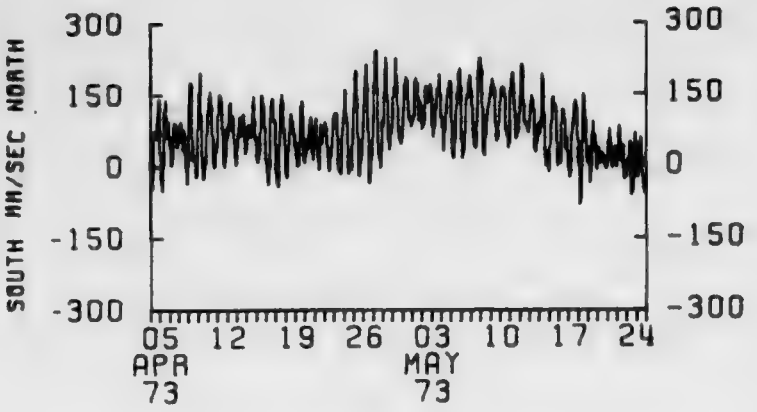


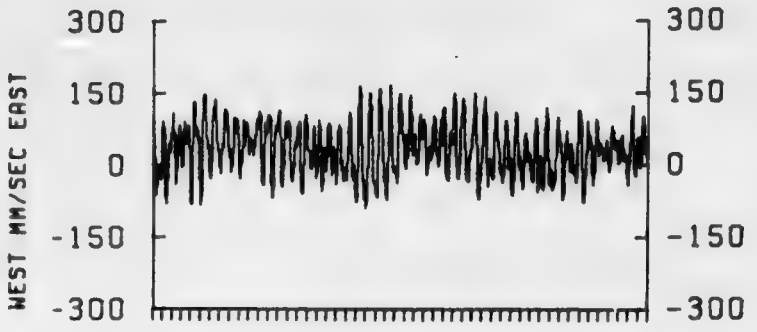
AUTO SPECTRUM
49938900 TEMPERATURE
728 METERS
73-IV-04 TO 73-V-24
1 PIECES WITH 2430 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
49938900 EAST
49938900 NORTH
728 METERS
73-IV-04 TO 73-V-24
1 PIECES WITH 2430 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS

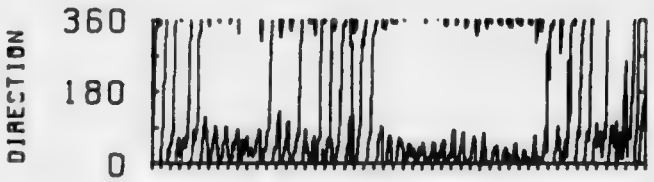

300
240
180
120
60
0
-60
-120
-180
-240
-300
SOUTH MM/SEC NORTH
-240
-120
0
120
240
WEST MM/SEC ERST
4993B1H
17
10
73-V-01
30
20
10
73-IV-05
N
0.
100.
KILOMETERS
4993B900
728 M
73- IV -05 TO 73- V -24

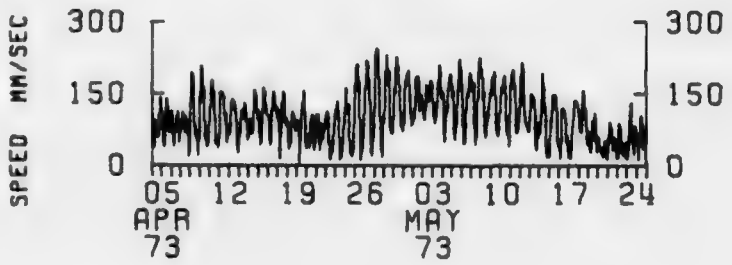




4993B1H

728 M





Mooring No. 500

Set 1973 April 4 (Year Month Day) 28° 17.0'N (Latitude) 69° 16.3'W (Longitude)

Set by J. Gifford - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 2

Retrieved 1973 June 27 (Year Month Day)

Retrieved by J. Gifford - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 6

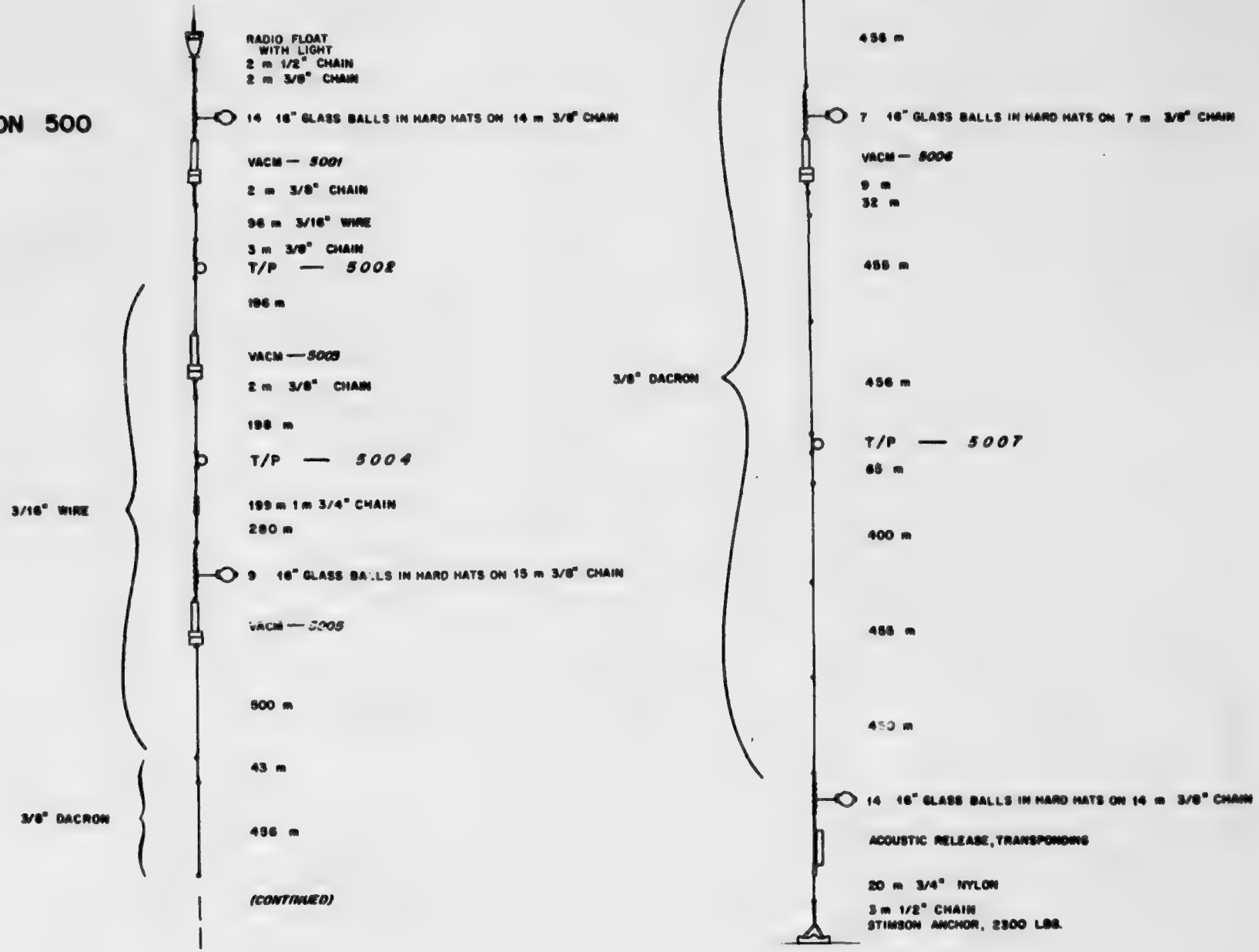
Purpose of Mooring: Mooring #2 of MODE 1 array

Mooring Type: Subsurface

Key	Data Number	Instrument Number	Type	Depth Meters Before	Depth Meters After April 26	Comments
*	5001	V-0129	VACM	379	334	
#	5002	#13	T/P	485	443	M.I.T.
*	5003	V-156	VACM	681	639	I.O.S.
#	5004	#47	T/P	882	840	M.I.T.
*	5005	V-0201	VACM	1382	1349	
	5006	V-0197	VACM	2914	2890	Flooded
+	5007	#30	T/P	3936	3923	
	Water depth			5456	5456	

COMMENTS ON MOORING:
April 4, 1973 0434Z Broke bottle of champagne over anchor
April 26, 1973 0900Z Mooring fouled by E. Katz' towfish
April 26, 1973 1700Z Tow cable free from mooring, mooring left in tact
June 27, 1973 0608Z Wire at 790 m damaged, probably by towfish
August 8, 1973 Pressure records indicate that the mooring line was stretched on April 26

STATION 500


RADIO FLOAT
WITH LIGHT
2 m 1/2" CHAIN
2 m 3/8" CHAIN
14 16" GLASS BALLS IN HARD HATS ON 14 m 3/8" CHAIN
VACM — 5001
2 m 3/8" CHAIN
96 m 3/16" WIRE
3 m 3/8" CHAIN
T/P — 5002
196 m
VACM — 5003
2 m 3/8" CHAIN
198 m
T/P — 5004
199 m 1 m 3/4" CHAIN
280 m
9 16" GLASS BALLS IN HARD HATS ON 15 m 3/8" CHAIN
VACM — 5005
500 m
43 m
496 m
(CONTINUED)
3/16" WIRE
3/8" DACRON
(CONTINUED)
456 m
7 16" GLASS BALLS IN HARD HATS ON 7 m 3/8" CHAIN
VACM — 5006
9 m
32 m
455 m
456 m
T/P — 5007
65 m
400 m
455 m
450 m
14 16" GLASS BALLS IN HARD HATS ON 14 m 3/8" CHAIN
ACOUSTIC RELEASE, TRANSPONDING
20 m 3/4" NYLON
3 m 1/2" CHAIN
STIMSON ANCHOR, 2300 LBS.
3/8" DACRON

DATA NUMBER 5001A

Instrument No.: V-0129 Type: Vector Averaging Current Meter

Depth: 379 m Water Depth: 5456 m

Start time: 73-April-04 08.07.30.

Stop time: 73-April-26 04.52.30.

Duration: 21d 20h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

Dual thermistors

All variables look good

Tow fish snagged mooring April 26

Data processed in two sections since instrument depth decreased by 45 meters

Data from only one thermistor is plotted due to the strong similarity of the data

STATS DATA/ 5001A0900A

	EAST	NORTH	SPEED	*****	EAST & NORTH	*****
MEAN =	125.04	-66.33	148.43	COVARIANCE =		498.46
STD. ERR. =	.98	.82	.80	STD. ERR. OF COVARIANCE =		114.35
VARIANCE =	1892.41	1408.95	1348.22	STD. DEV. OF COVARIANCE =		5240.13
STD. DEV. =	43.96	37.54	36.69	CORRELATION COEFFICIENT =		.303
KURTOSIS =	3.68	3.04	3.42	VECTOR MEAN =		141.55
SKEWNESS =	.05	.47	.18	VECTOR VARIANCE =		1870.88
				STD. DEV. =		40.87

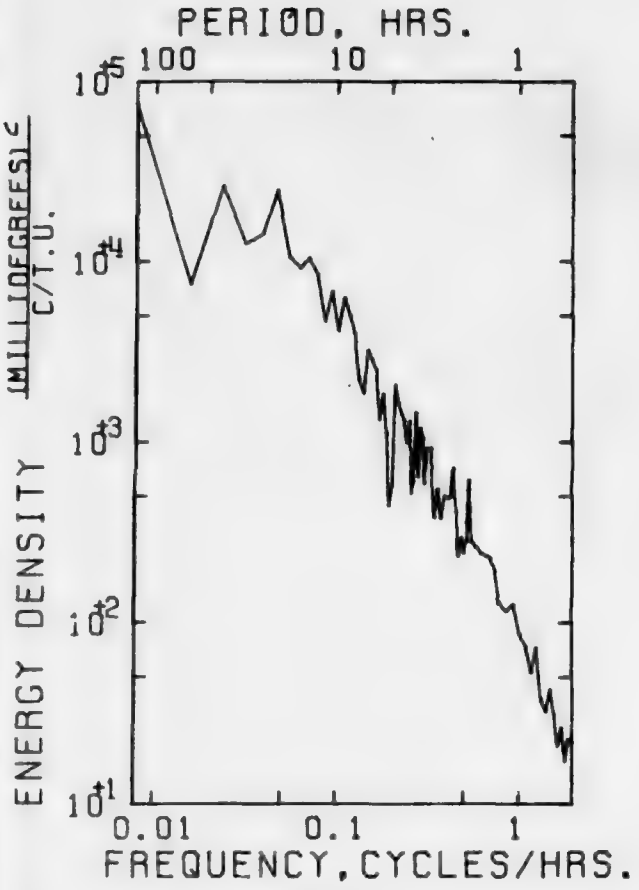
UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 2100 POINTS

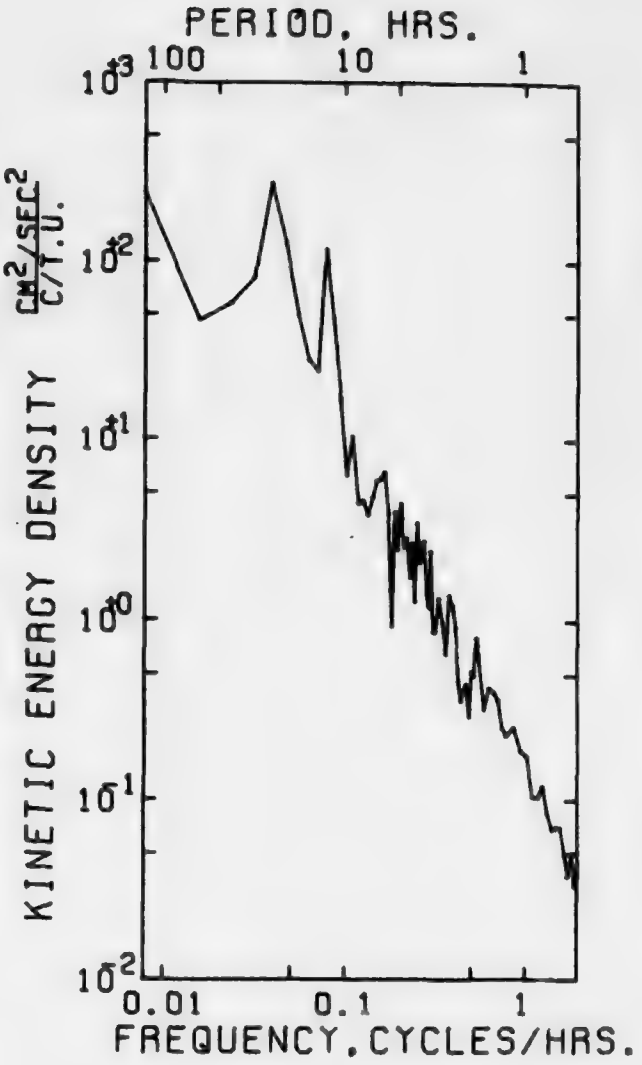
SPANNING RANGE
FROM 73- IV -04 08.07.30
TO 73- IV -26 04.52.30

DURATION 21 DAYS 20 H 45 M

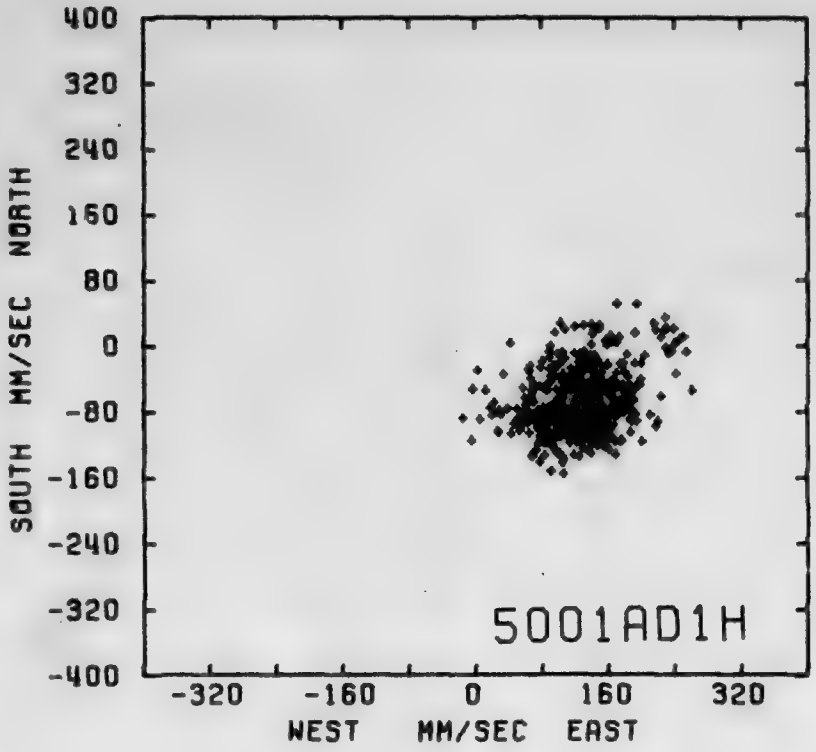
VARIABLE	TEMP1	TEMP2
UNITS	DEGREES C.	DEGREES C.
MEAN	17.739	17.729
STD. ERR.	.118E-2	.118E-2
VARIANCE	.293E-2	.293E-2
STD. DEV.	.541E-1	.542E-1
KURTOSIS	2.945	2.951
SKEWNESS	.392	.392
MINIMUM	17.620	17.610
MAXIMUM	17.918	17.909



AUTO SPECTRUM
5001AD900 TEMPERATURE
379 METERS
73-IV-04 TO 73-IV-25
1 PIECES WITH 1024 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
5001AD900 EAST
5001AD900 NORTH
379 METERS
73-IV-04 TO 73-IV-25
1 PIECES WITH 1024 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS


400
320
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160
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-80
-160
-240
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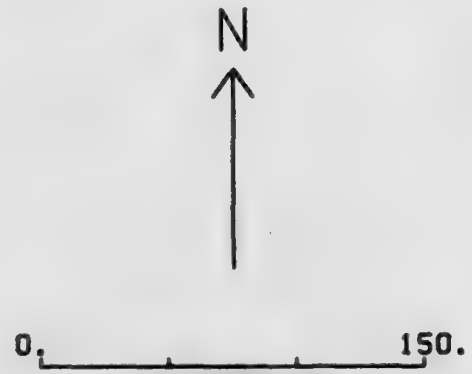
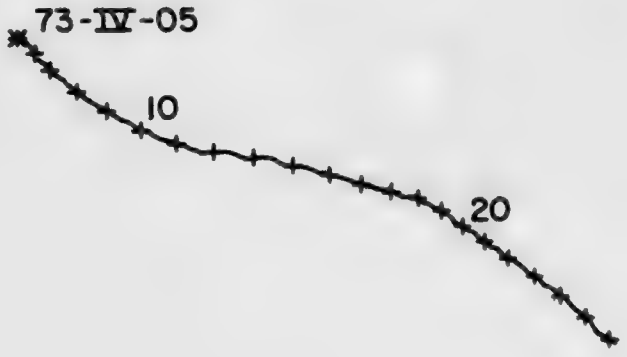
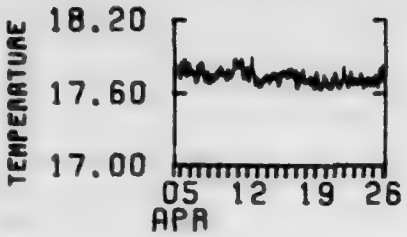
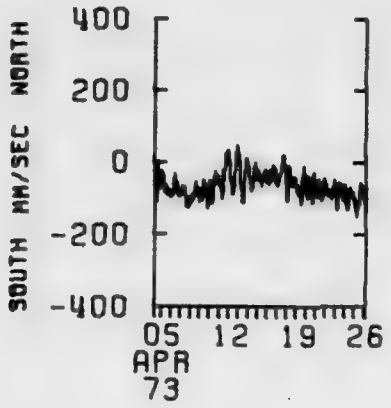
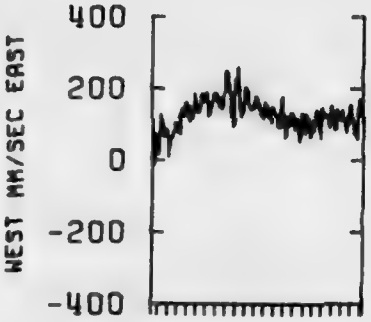
-400
SOUTH MM/SEC NORTH
-320
-160
0
160
320
WEST
MM/SEC
EAST
5001AD1H


N
0.
150.
KILOMETERS
5001AD900
379 M
73- IV -05 TO 73- IV 26


73-IV-05
10
20

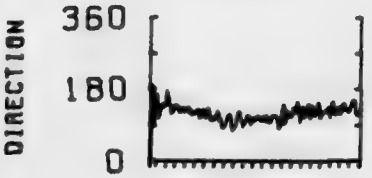


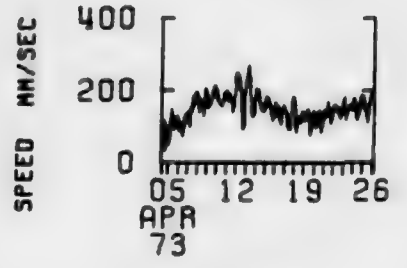




5001AD1H

379 M





DATA NUMBER 5001B

Instrument No.: V-0129 Type: Vector Averaging Current Meter

Depth: 334 m Water Depth: 5456 m

Start time: 73-April-26 18.07.30.

Stop time: 73-June-27 02.52.30.

Duration: 61d 8h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:
Dual thermistors

All variables look good

Tow fish snagged mooring April 26

Data processed in two sections because instrument depth decreased by 45 meters

Data from only one thermistor is plotted due to the strong similarity of the data

STATS DATA/ 5001B09008

	EAST	NORTH	SPEED	***** EAST & NORTH *****
MEAN =	16.61	-123.05	144.49	COVARIANCE = 72.28
STD. ERR. =	.97	.63	.64	STD. ERR. OF COVARIANCE = 131.86
VARIANCE =	5585.04	2335.45	2440.13	STD. DEV. OF COVARIANCE = 10121.11
STD. DEV. =	74.60	48.33	48.40	CORRELATION COEFFICIENT = .020
KURTOSIS =	5.84	4.19	5.07	VECTOR MEAN = 124.17
SKEWNESS =	.51	-.53	1.10	VECTOR VARIANCE = 3950.24
				STD. DEV. = 62.85

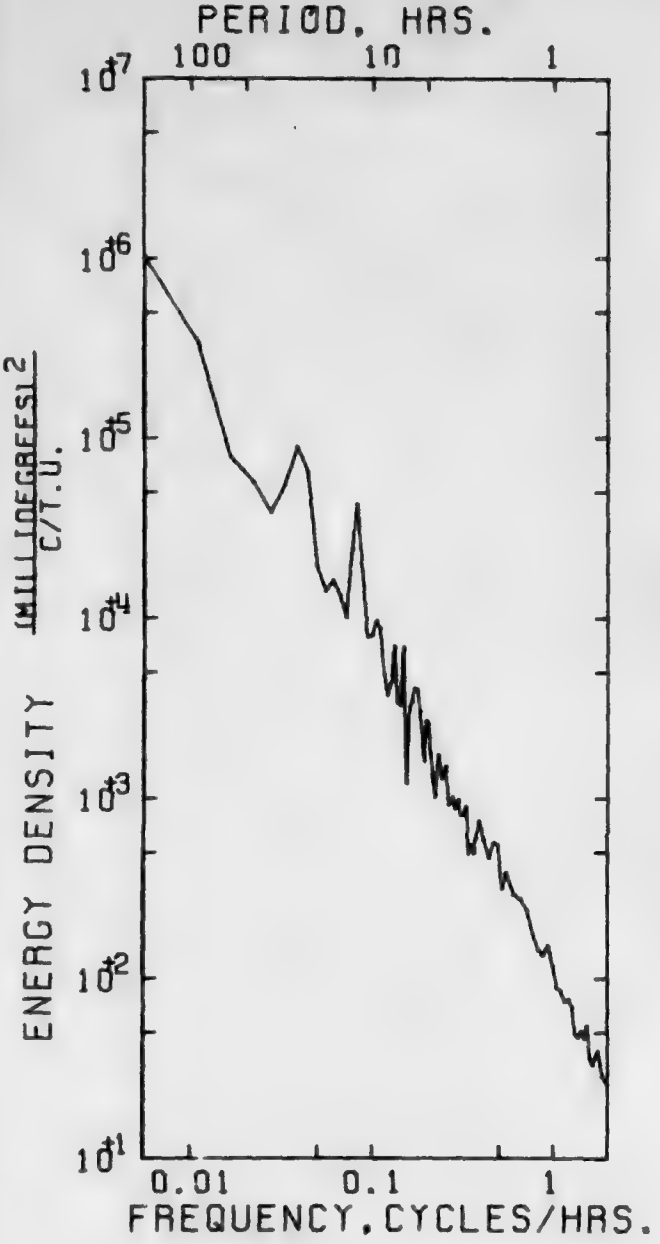
UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 5892 POINTS

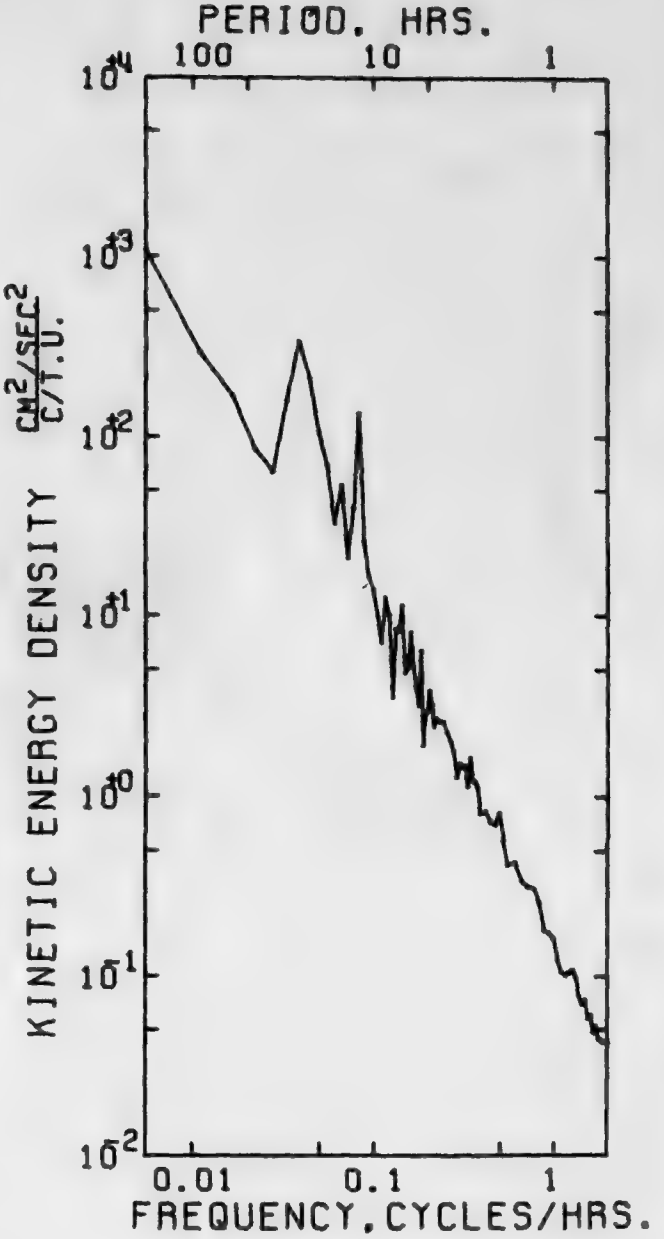
SPANNING RANGE
FROM 73- IV -26 18.07.30
TO 73- VI -27 02.52.30

DURATION 61 DAYS 8 H 45 M

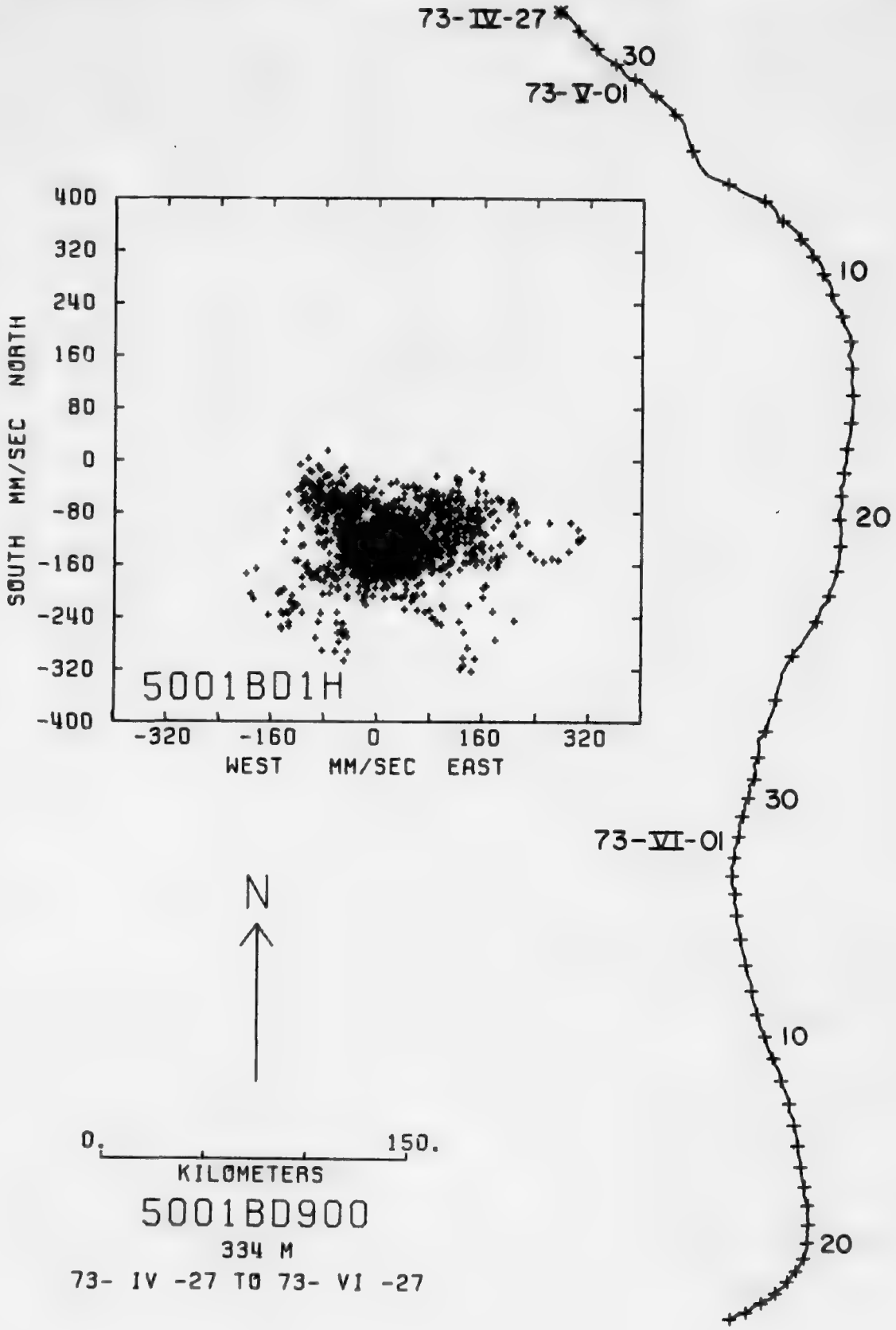
VARIABLE	TEMP1	TEMP2
UNITS	DEGREES C.	DEGREES C.
MEAN =	17.757	17.747
STD. ERR. =	.350E-2	.350E-2
VARIANCE =	.721E-1	.724E-1
STD. DEV. =	.269	.269
KURTOSIS =	2.154	2.154
SKEWNESS =	-.523	-.522
MINIMUM =	17.154	17.143
MAXIMUM =	18.243	18.234

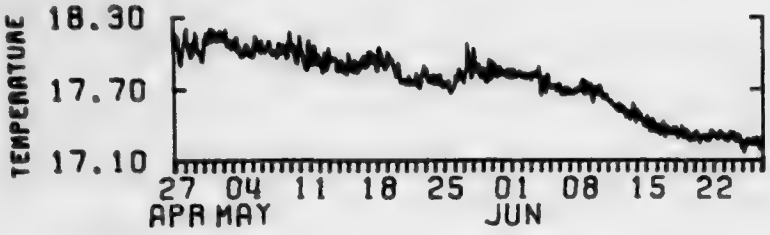


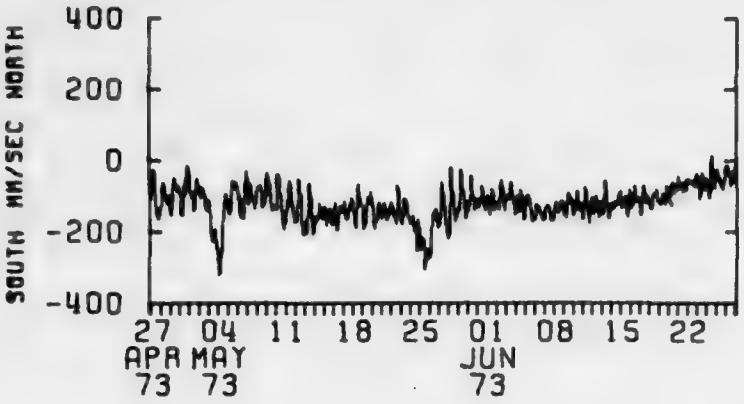
AUTO SPECTRUM
500180900 TEMPERATURE
334 METERS
73-IV-26 TO 73-VI-26
1 PIECES WITH 2916 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS

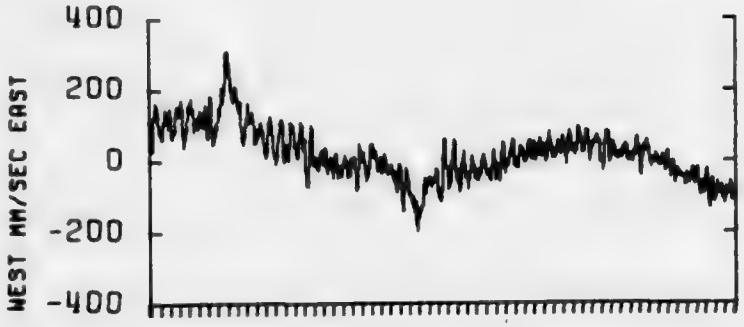


AUTO SPECTRUM
500180900 EAST
500180900 NORTH
334 METERS
73-IV-26 TO 73-VI-26
1 PIECES WITH 2916 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS


73-IV-27
30
73-V-01
10
20
30
73-VI-01
10
20
400
320
240
160
80
0
-80
-160
-240
-320
-400
SOUTH MM/SEC NORTH
-320
-160
0
160
320
WEST MM/SEC EAST
5001BD1H
N
0.
150.
KILOMETERS
5001BD900
334 M
73- IV -27 TO 73- VI -27

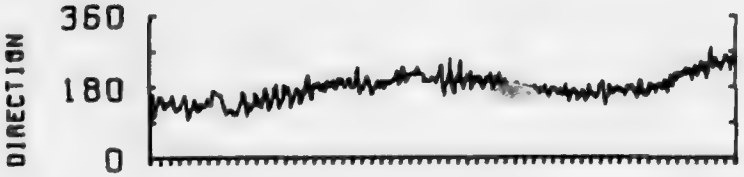


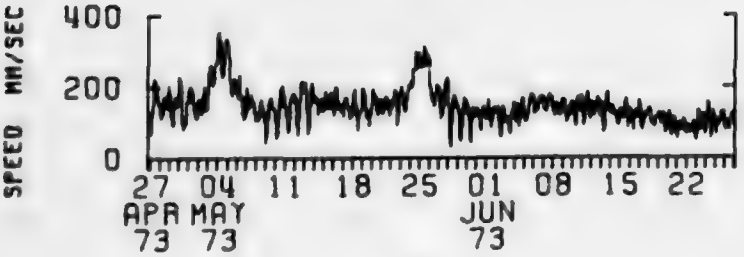




5001BD1H

334 M





DATA NUMBER 5003A

Instrument No.: V-0156 Type: Vector Averaging Current Meter

Depth: 681 m Water Depth: 5456 m

Start time: 73-April-04 08.07.30.

Stop time: 73-April-26 04.52.30.

Duration: 21d 20h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:
Instrument owned by Institute of Oceanographic Sciences

Mooring snagged by tow fish April 26

Compass - good

Vane - sticky June 9 to recovery

Rotor - At threshold May 14 to 18 and May 27 to recovery

Temperature - good

Data processed in two sections because instrument depth decreased by 42 meters

STATS DATA/ 5003AC900A

	EAST	NORTH	SPEED			EAST & NORTH	
MEAN =	72.68	-65.04	108.58	*	*****		*****
STD. ERR. =	1.04	1.01	.98	*	COVARIANCE	=	-211.32
VARIANCE =	2281.38	2155.01	1820.04	*	STD. ERR. OF COVARIANCE	=	111.77
STD. DEV. =	47.55	48.42	43.82	*	STD. DEV. OF COVARIANCE	=	5122.10
KURTOSIS =	9.14	2.97	2.56	*	CORRELATION COEFFICIENT	=	-.088
SKEWNESS =	.08	.19	.22	*	VECTOR MEAN	=	97.59
				*	VECTOR VARIANCE	=	2208.19
				*	STD. DEV.	=	46.99

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 2100 POINTS

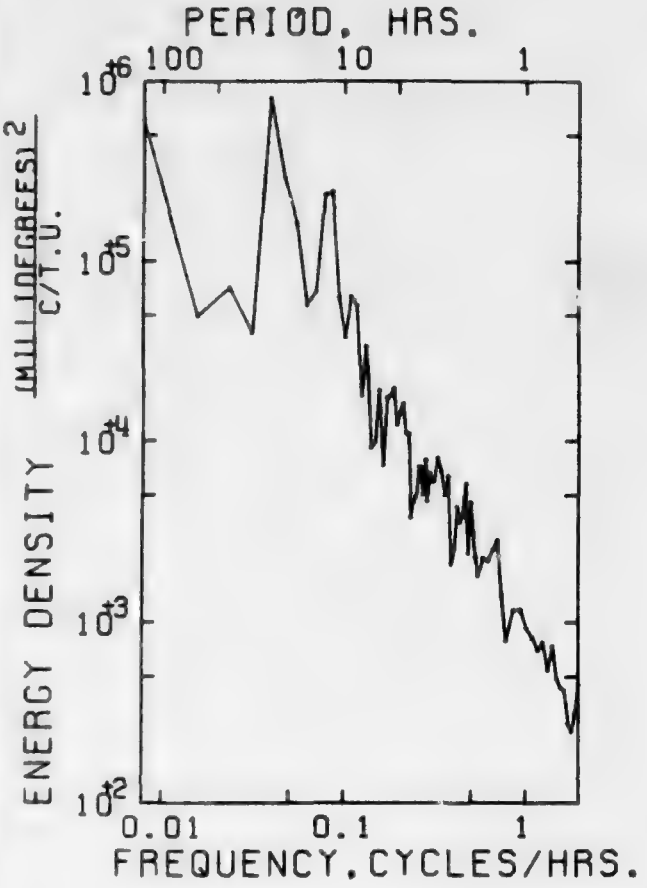
*** TEMPERATURE ***
*** DEGREES C. ***

SPANNING RANGE
FROM 73- IV -04 08.07.30
TO 73- IV -26 04.52.30

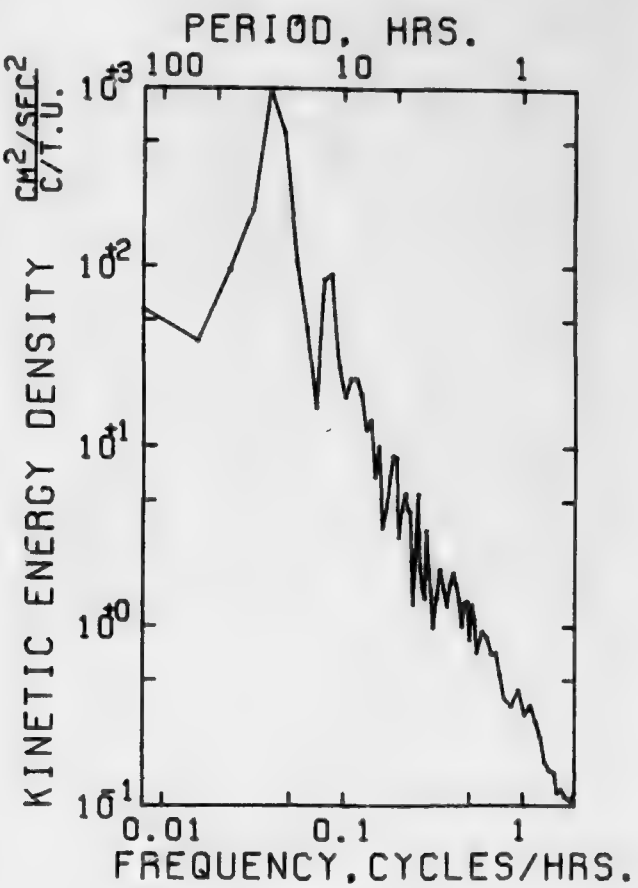
DURATION 21 DAYS 20 H 45 M

MEAN = 13.915 STD ERR = .004
VARIANCE = .031
STD. DEV. = .177
KURTOSIS = 2.530
SKEWNESS = -.111

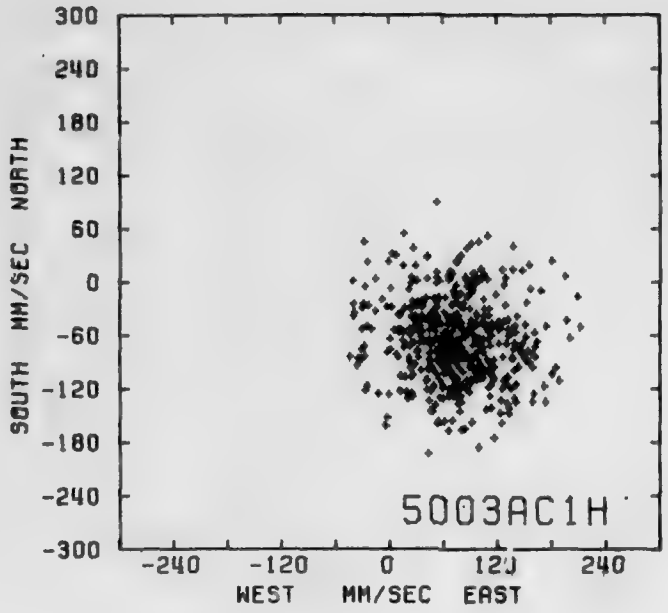
SAMPLE SIZE = 2100 POINTS

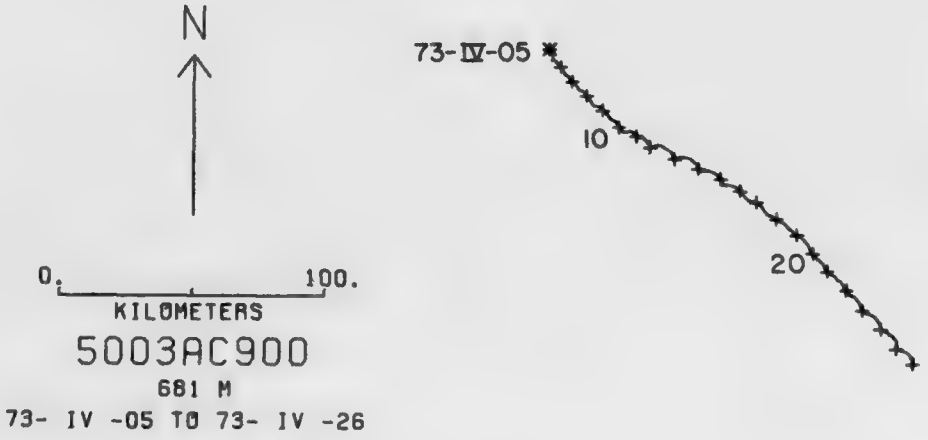


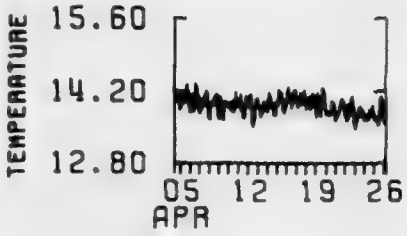
AUTO SPECTRUM
5003AC900 TEMPERATURE
681 METERS
73-IV-04 TO 73-IV-25
1 PIECES WITH 1024 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS

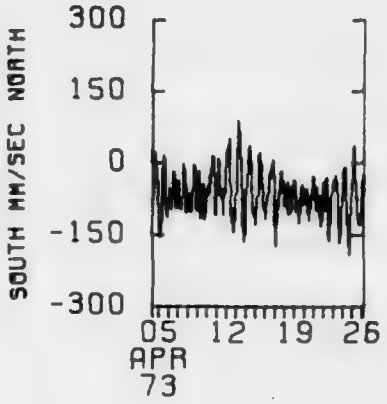


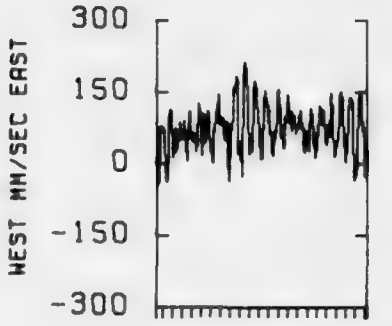
AUTO SPECTRUM
5003AC900 EAST
5003AC900 NORTH
681 METERS
73-IV-04 TO 73-IV-25
1 PIECES WITH 1024 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS


300
240
180
120
60
0
-60
-120
-180
-240
-300
SOUTH MM/SEC NORTH
5003AC1H
-240
-120
0
120
240
WEST MM/SEC EAST


N
0.
100.
KILOMETERS
5003AC900
681 M
73- IV -05 TO 73- IV -26
73-IV-05
10
20

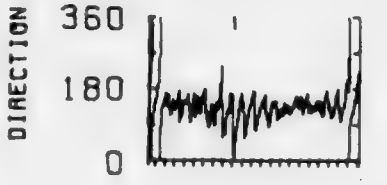


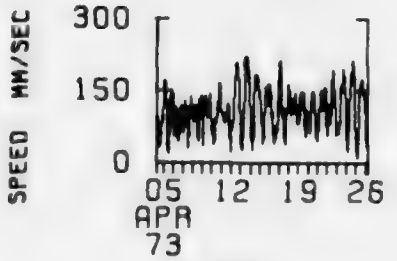




5003AC1H

681 M





DATA NUMBER 5003B

Instrument No.: V-0156 Type: Vector Averaging Current Meter

Depth: 639 m Water Depth: 5456 m

Start time: 73-April-26 18.07.30.

Stop time: 73-May-13 23.52.30.

Duration: 17d 5h 43m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:
Instrument owned by Institute of Oceanographic Sciences

Mooring snagged by towfish April 26

Compass - good

Vane - sticky June 9 to recovery

Rotor - at threshold May 14 to 18 and May 27 to recovery

Temperature - good

Data processed in two sections because instrument depth decreased by 42 meters

STATS DATA/ 5003BC900A

	EAST	NORTH	SPEED	***** EAST & NORTH *****
MEAN =	61.10	-73.35	105.50	COVARIANCE = -436.47
STD. ERR. =	1.14	.85	1.00	STD. ERR. OF COVARIANCE = 124.84
VARIANCE =	2182.83	1509.40	1880.32	STD. DEV. OF COVARIANCE = 5089.80
STD. DEV. =	46.50	38.77	40.75	CORRELATION COEFFICIENT = -.242
KURTOSIS =	2.82	3.80	2.56	VECTOR MEAN = 95.52
SKEWNESS =	-.08	.41	.33	VECTOR VARIANCE = 1899.01
				STD. DEV. = 42.81

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 1656 POINTS

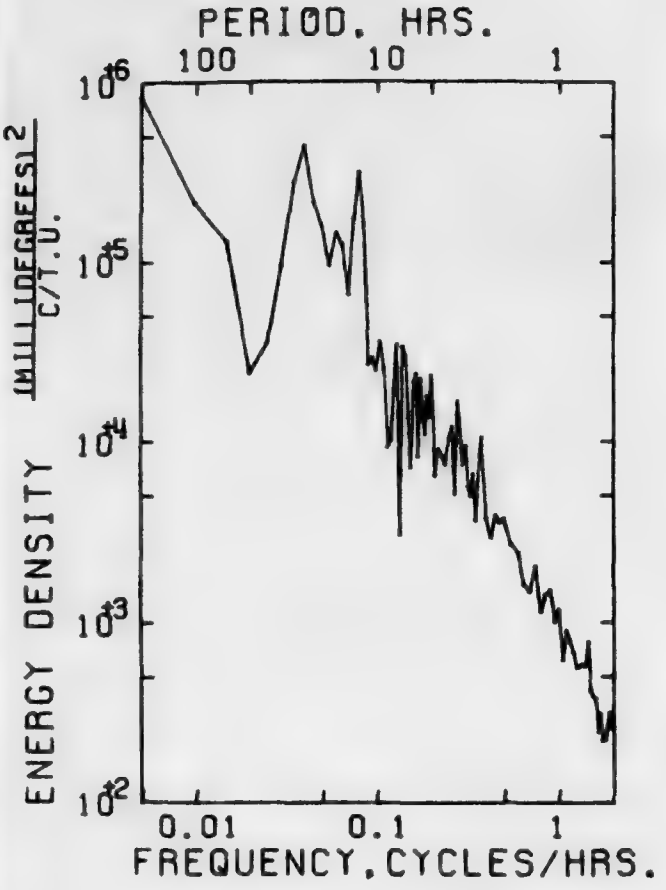
*** TEMPERATURE ***
*** DEGREES C. ***

SPANNING RANGE
FROM 73- IV -26 18.07.30
TO 73- V -13 23.52.30

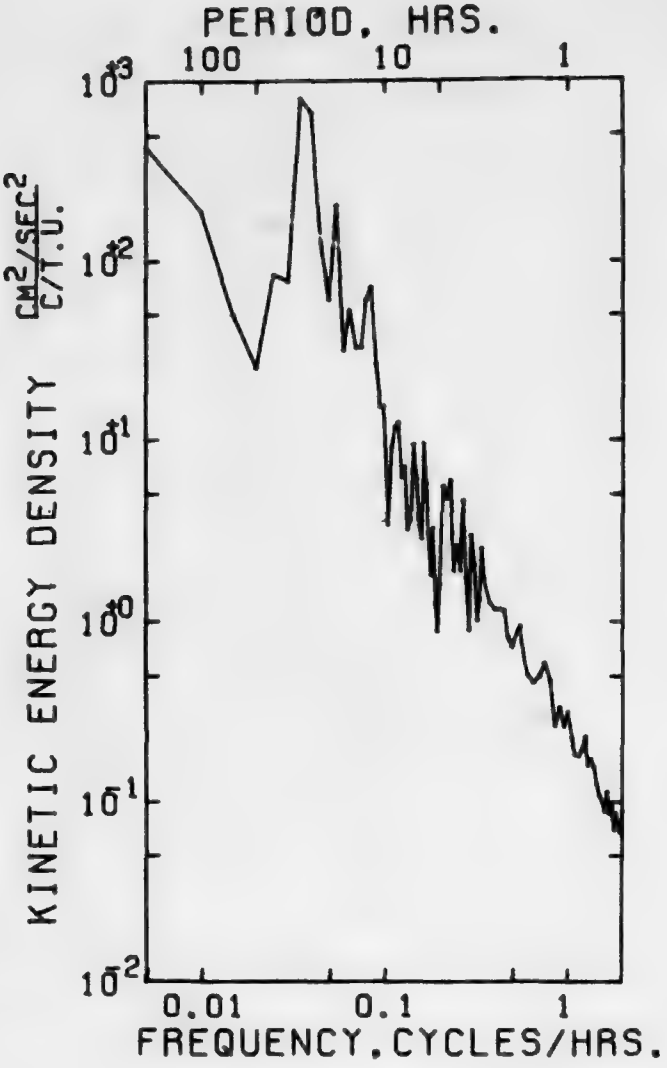
DURATION 17 DAYS 5 H 45 M

MEAN = 14.804 STD ERR = .004
VARIANCE = .024
STD. DEV. = .154
KURTOSIS = 2.829
SKEWNESS = -.104

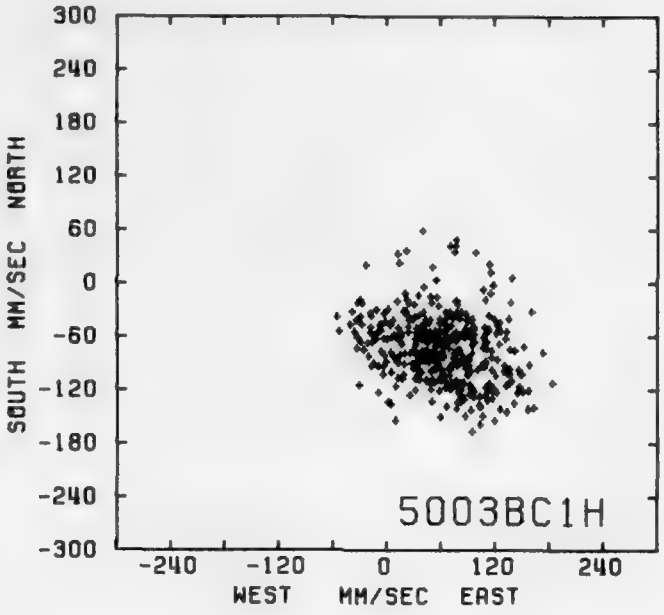
SAMPLE SIZE = 1656 POINTS

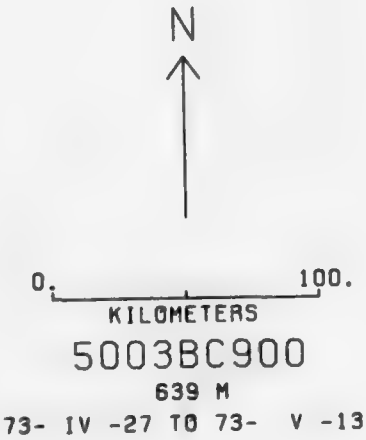


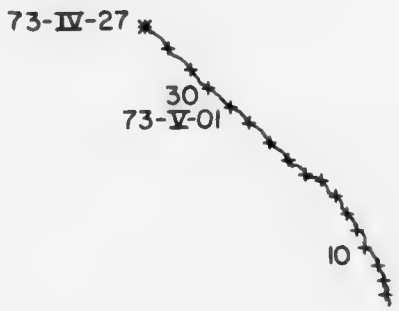
AUTO SPECTRUM
5003BC900 TEMPERATURE
639 METERS
73-IV-26 TO 73-V-13
1 PIECES WITH 810 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS

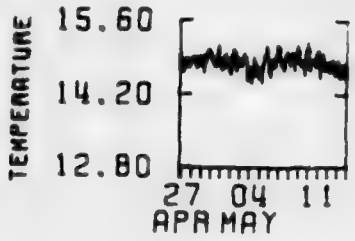


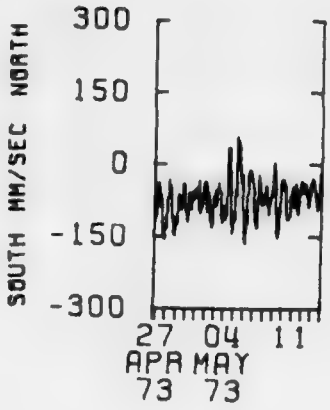
AUTO SPECTRUM
5003BC900 EAST
5003BC900 NORTH
639 METERS
73-IV-26 TO 73-V-13
1 PIECES WITH 810 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS

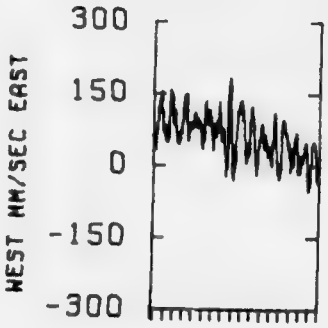

300
240
180
120
60
0
-60
-120
-180
-240
-300
SOUTH MM/SEC NORTH
5003BC1H
-240
-120
0
120
240
WEST
MM/SEC
EAST


N
0.
100.
KILOMETERS
5003BC900
639 M
73- IV -27 TO 73- V -13


73-IV-27
30
73-V-01
10

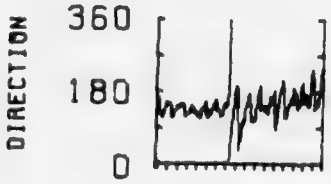


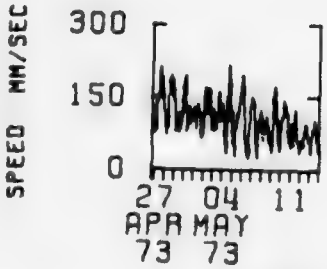




5003BC1H

639 M





DATA NUMBER 5005

Instrument No.: V-0201 Type: Vector Averaging Current Meter

Depth: 1382 m Water Depth: 5456 m

Start time: 73-April-04 08.07.30.

Stop time: 73-April-26 04.52.30.

Duration: 21d 20h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

Mooring snagged by towfish April 26, slight depth change

Compass - good

Vane - stuck May 9 to recovery

Rotor - at threshold from April 26 to recovery

Temperature - good

STATS DATA/ 5005S900A

	EAST	NORTH	SPEED	*****	EAST & NORTH	*****
MEAN =	-11.75	-50.10	60.18	= COVARIANCE =		-72.76
STD. ERR. =	.62	.55	.48	= STD. ERR. OF COVARIANCE =		33.26
VARIANCE =	817.29	844.89	488.69	= STD. DEV. OF COVARIANCE =		1524.07
STD. DEV. =	28.59	29.39	22.11	= CORRELATION COEFFICIENT =		-.100
KURTOSIS =	2.97	2.58	2.95	= VECTOR MEAN =		51.46
SKEWNESS =	.16	-.01	.04	= VECTOR VARIANCE =		731.09
				= STD. DEV. =		27.04

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 2100 POINTS

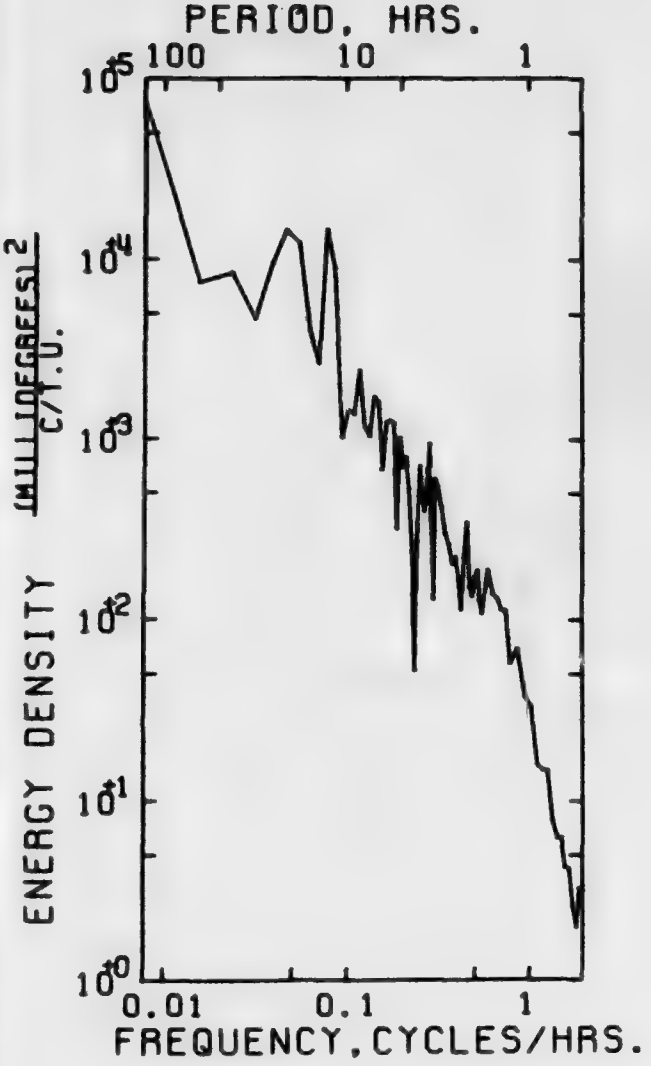
SPANNING RANGE
FROM 73- IV -04 08.07.30
TO 73- IV -26 04.52.30

DURATION 21 DAYS 20 H 45 M

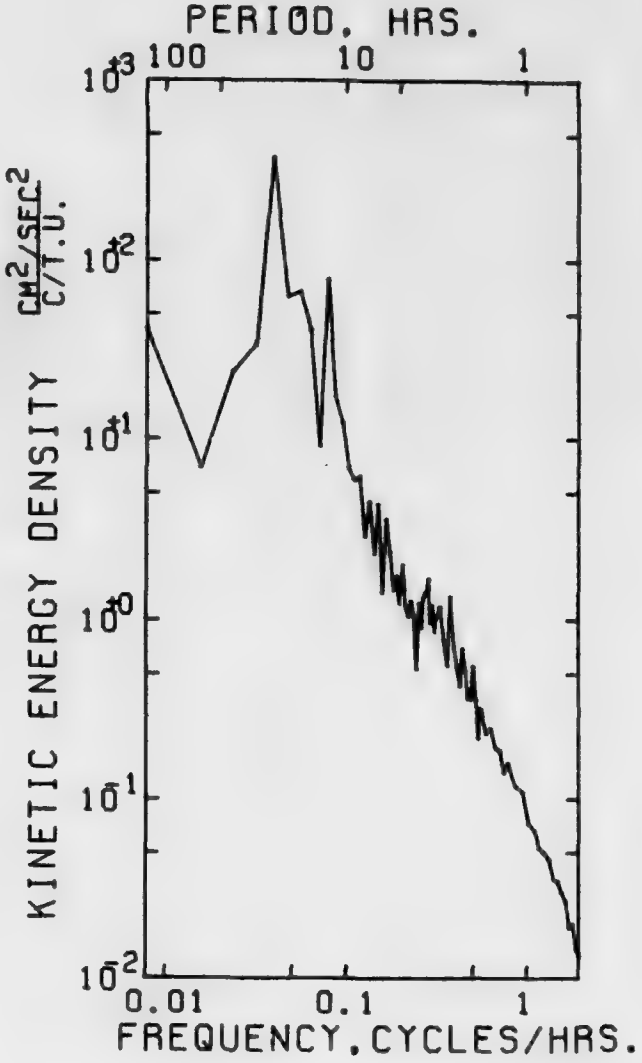
*** TEMPERATURE ***
*** DEGREES C. ***

MEAN =	4.707	STD ERR =	.002
VARIANCE =	.007		
STD. DEV. =	.081		
KURTOSIS =	1.726		
SKEWNESS =	-.331		

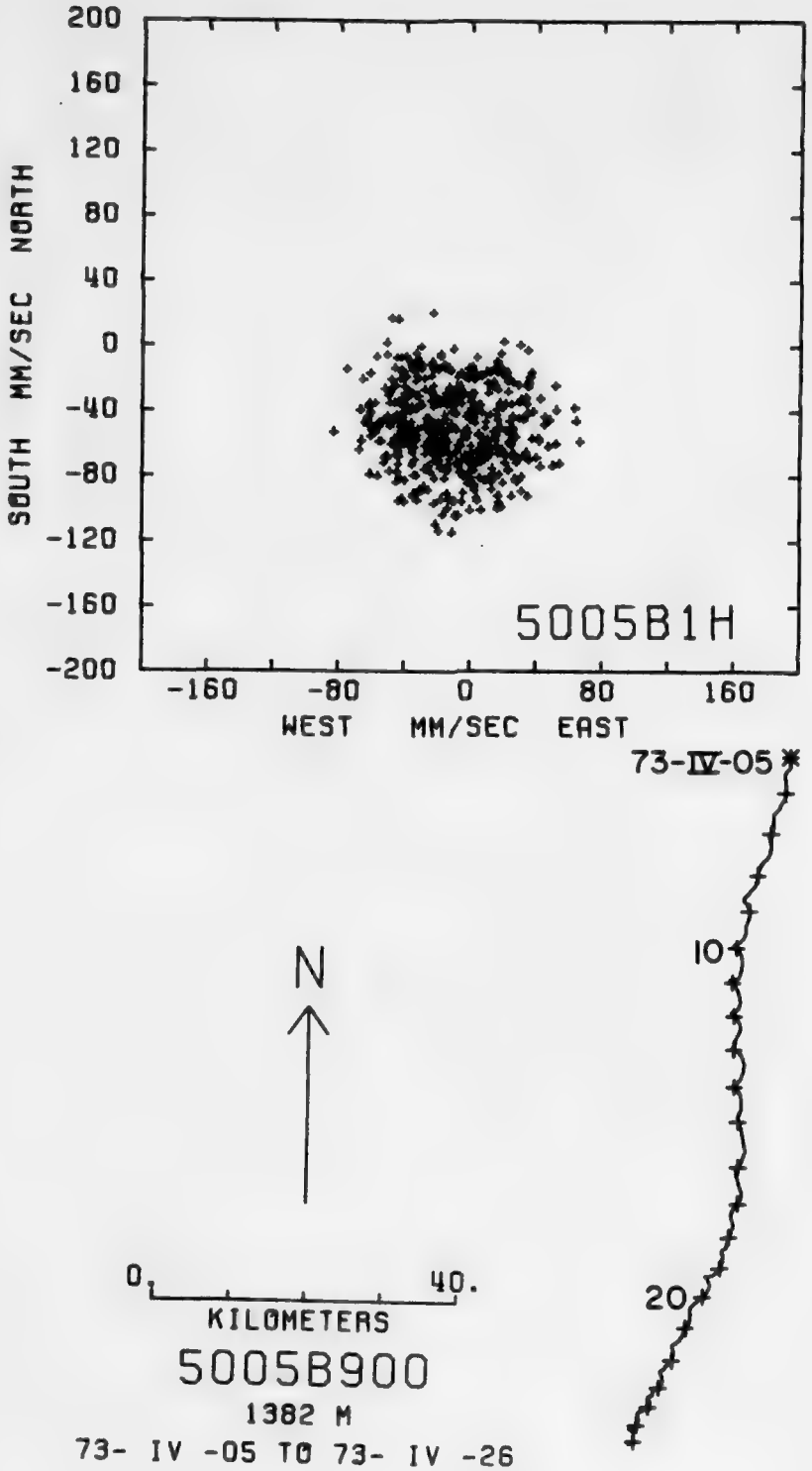
SAMPLE SIZE = 2100 POINTS

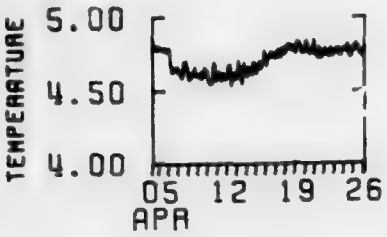


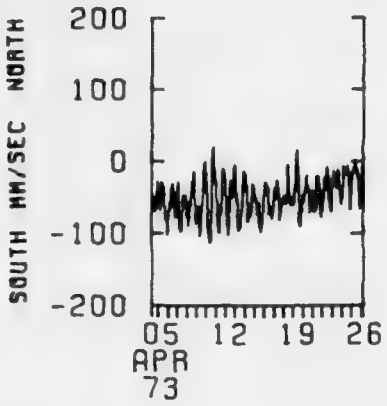
AUTO SPECTRUM
50058900 TEMPERATURE
1382 METERS
73-IV-04 TO 73-IV-25
1 PIECES WITH 1024 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS

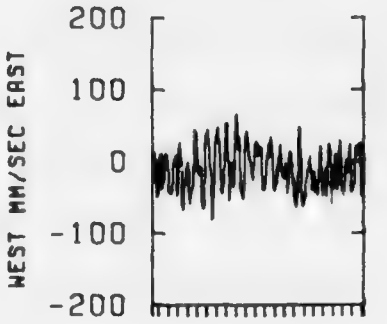


AUTO SPECTRUM
50058900 EAST
50058900 NORTH
1382 METERS
73-IV-04 TO 73-IV-25
1 PIECES WITH 1024 ESTIMATES
PER PIECE. AVERAGED OVER
4 ADJACENT FREQUENCY BANDS


200
160
120
80
40
0
-40
-80
-120
-160
-200
SOUTH MM/SEC NORTH
-160
-80
0
80
160
WEST MM/SEC EAST
5005B1H
73-IV-05
10
20
N
0
40.
KILOMETERS
5005B900
1382 M
73- IV -05 TO 73- IV -26

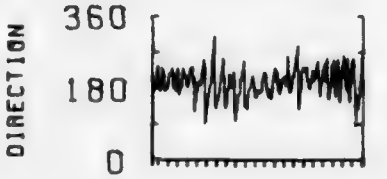


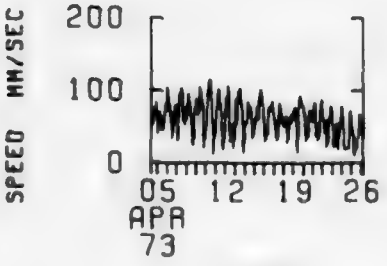




5005B1H

1382 M





Mooring No. 501

Set 1973 April 4 (Year Month Day) 28° 50.1'N (Latitude) 69° 18.0'W (Longitude)

Set by G. Tupper - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 2

Retrieved 1973 June 30 (Year Month Day)

Retrieved by J. Gifford - R. Heinmiller Ship R.V. CHAIN Cruise 112 Leg 6

Purpose of Mooring: Mooring #7 of MODE 1 array

Mooring Type: Subsurface

Key	Data Number	Instrument Number	Type	Depth Meters	Comments
*	5011	V-0164	VACM	421	
#	5012	#35	T/P	523	M.I.T.
+	5013	M-198t	850	723	
	5014	#53	T/P	925	M.I.T.
*	5015	V-0128	VACM	1425	
*	5016	V-0204	VACM	2936	
*	5017	M-195t	850t	3951	
*	5018	M-284	850	5279	
	Water depth			5379	

COMMENTS ON MOORING:

STATION 501

RADIO FLOAT
WITH LIGHT
2 m 1/2" CHAIN
2 m 3/8" CHAIN
12-16"+ 2-17" GLASS BALLS IN HARD HATS ON 14 m 3/8" CHAIN
VACM — 5011
2 m 3/8" CHAIN
96 m 3/16" WIRE
3 m 3/8" CHAIN
T/P — 5012
196 m 3/16" WIRE
CURRENT METER — 5013
2 m 3/8" CHAIN
198 m 3/16" WIRE
T/P — 5014
199 m 3/16" WIRE
1 m 3/8" CHAIN
280 m 3/16" WIRE
10 16" GLASS BALLS IN HARD HATS ON 15 m 3/8" CHAIN
VACM — 5015
500 m 3/16" WIRE
35 m 3/8" DACRON
(CONTINUED)
(CONTINUED)
458 m 3/8" DACRON
457 m 3/8" DACRON
5 16" GLASS BALLS IN HARD HATS ON 8 m 3/8" CHAIN
VACM — 5016
40 m
456 m
456 m
CURRENT METER — 5017
335 m
3/8" DACRON
447 m
457 m
CURRENT METER — 5018
57 m
15 16" GLASS BALLS IN HARD HATS ON 15 m 3/8" CHAIN
ACOUSTIC RELEASE, TRANSPONDING
15 m 3/4" NYLON
3 m 1/2" CHAIN
STIMSON ANCHOR, 2500 LBS.

DATA NUMBER 5011

Instrument No.: V-0164 Type: Vector Averaging Current Meter

Depth: 421 m Water Depth: 5379 m

Start time: 73-April-04 20.07.30.

Stop time: 73-May-23 23.52.30.

Duration: 49d 3h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

Compass - good

Vane - good

Rotor - suspicious May 24 to June 12

Temperature - good

STATS DATA/ 5011C900A

	EAST	NORTH	SPEED	*****	EAST & NORTH	*****
MEAN =	64.39	-26.89	81.76	COVARIANCE =		53.35
STD. ERR. =	.60	.48	.56	STD. ERR. OF COVARIANCE =		47.76
VARIANCE =	2182.36	1109.87	1486.44	STD. DEV. OF COVARIANCE =		5280.86
STD. DEV. =	46.72	33.31	38.55	CORRELATION COEFFICIENT =		.034
KURTOSIS =	3.09	4.89	2.73	VECTOR MEAN =		69.77
SKEWNESS =	-.04	.02	.73	VECTOR VARIANCE =		1851.11
				STD. DEV. =		40.63

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 4720 POINTS

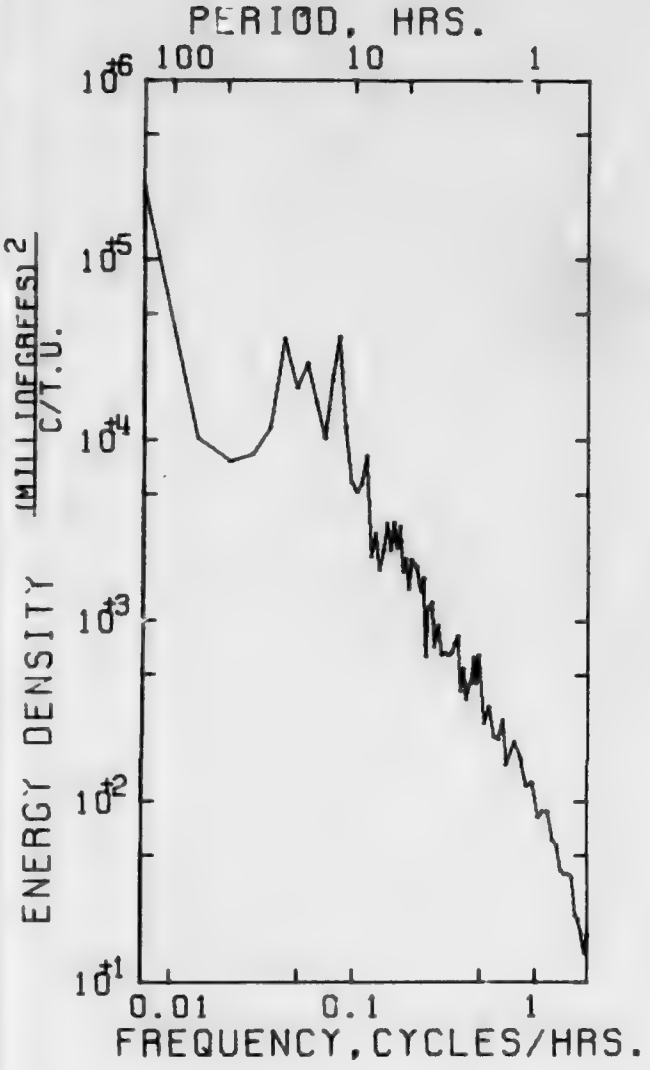
*** TEMPERATURE ***
*** DEGREES C. ***

SPANNING RANGE
FROM 73- IV -04 20.07.30
TO 73- V -23 23.52.30

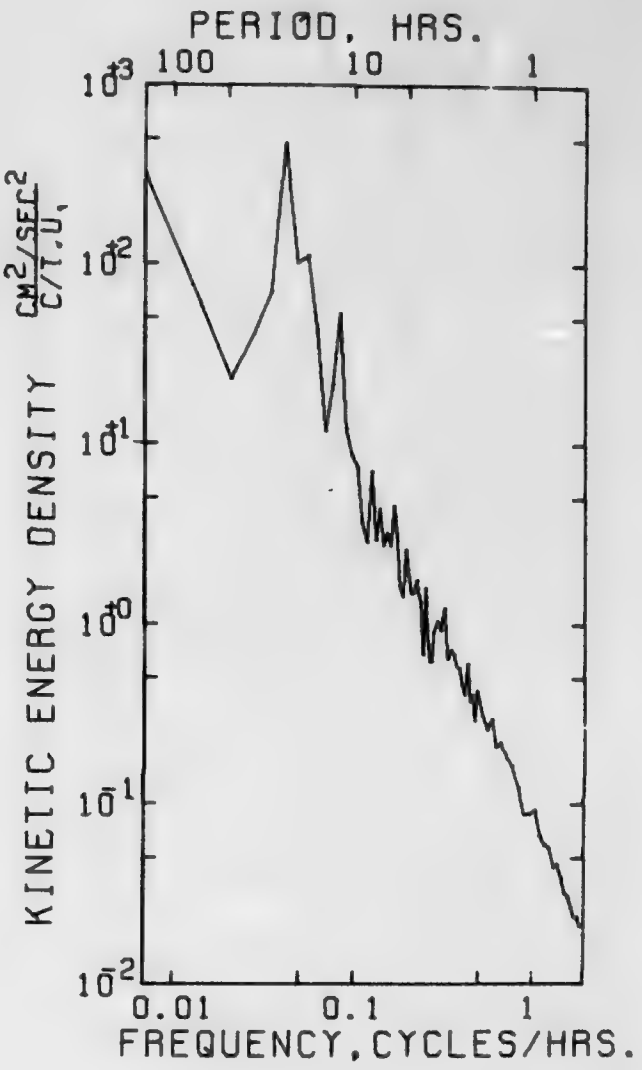
DURATION 48 DAYS 3 H 45 M

MEAN = 17.282 STD ERR = .002
VARIANCE = .016
STD. DEV. = .125
KURTOSIS = 2.801
SKEWNESS = .129

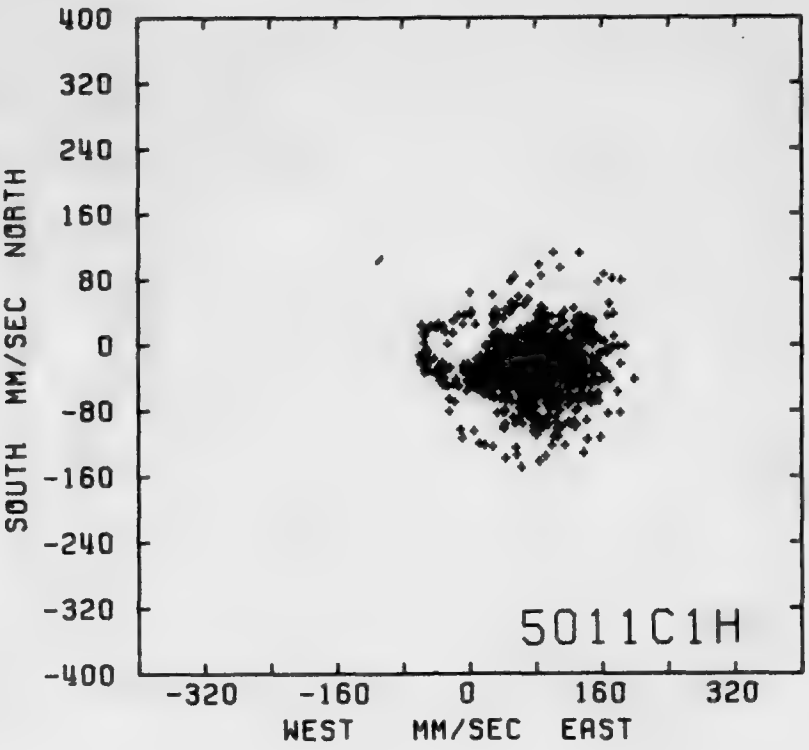
SAMPLE SIZE = 4720 POINTS

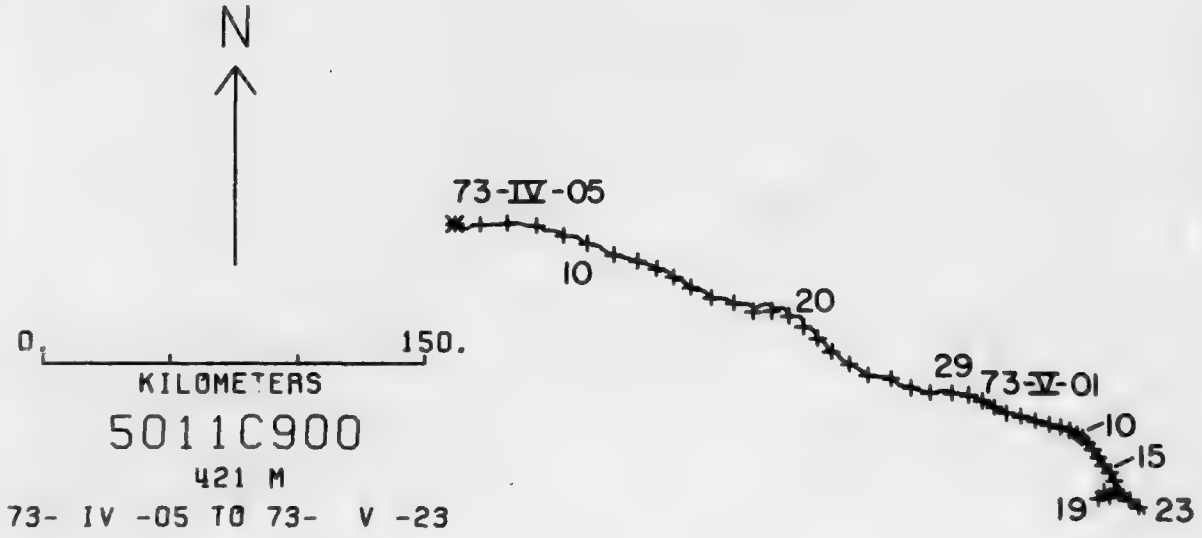


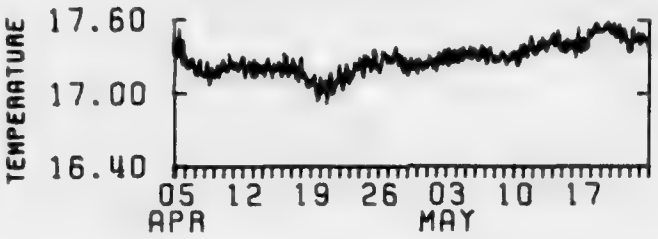
AUTO SPECTRUM
5011C900 TEMPERATURE
421 METERS
73-IV-04 TO 73-V-21
1 PIECES WITH 2304 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS

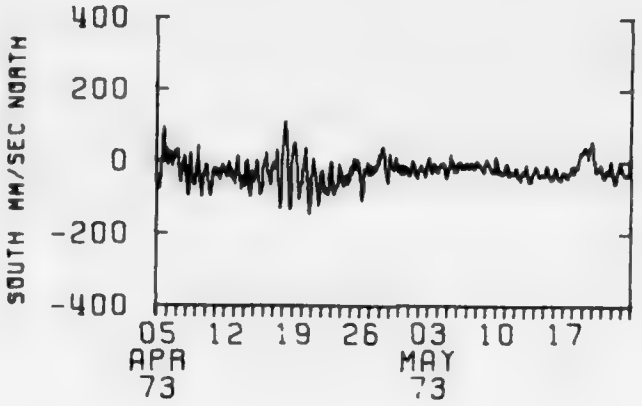


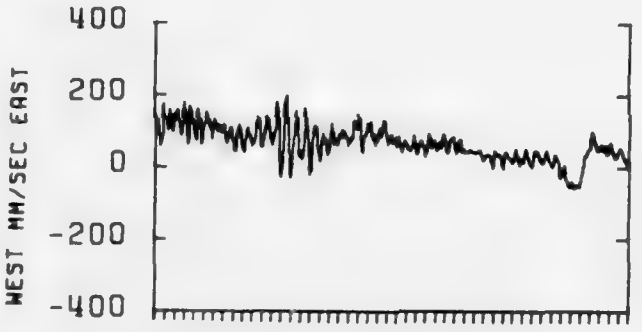
AUTO SPECTRUM
5011C900 EAST
5011C900 NORTH
421 METERS
73-IV-04 TO 73-V-22
1 PIECES WITH 2304 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS


400
320
240
160
80
0
-80
-160
-240
-320
-400
SOUTH MM/SEC NORTH
-320
-160
0
160
320
WEST MM/SEC EAST
5011C1H


N
0.
150.
KILOMETERS
5011C900
421 M
73- IV -05 TO 73- V -23
73-IV-05
10
20
29
73-V-01
10
15
19
23

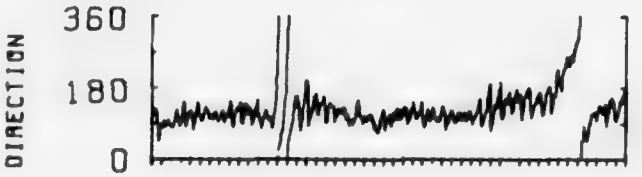


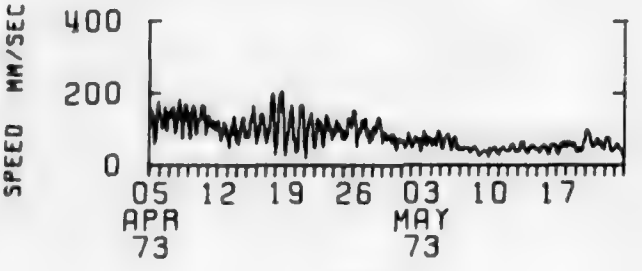




5011C1H

421 M





DATA NUMBER 5015

Instrument No.: V-0128 Type: Vector Averaging Current Meter

Depth: 1425 m Water Depth: 5379 m

Start time: 73-April-04 16.37.00.

Stop time: 73-May-24 05.22.00.

Duration: 49d 12h 45m

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:

Compass - good

Vane - slightly sticky May 24 to June 10, sticky to stuck June 24 to recovery

Rotor - good

Temperature - good

STATS DATA/ 5015F900A

	EAST	NORTH	SPEED
MEAN =	-7.01	-39.20	55.35
STD. ERR. =	.36	.59	.40
VARIANCE =	601.50	1620.18	757.69
STD. DEV. =	24.53	40.35	27.53
KURTOSIS =	2.94	2.12	2.00
SKEWNESS =	.08	.19	.39

****** EAST & NORTH	******
COVARIANCE =	49.71
STD. ERR. OF COVARIANCE =	18.24
STD. DEV. OF COVARIANCE =	1258.15
CORRELATION COEFFICIENT =	.050
VECTOR MEAN =	39.80
VECTOR VARIANCE =	1114.84
STD. DEV. =	33.39

UNITS OF RAW DATA VARIABLES = MM/SEC

SAMPLE SIZE = 4756 POINTS

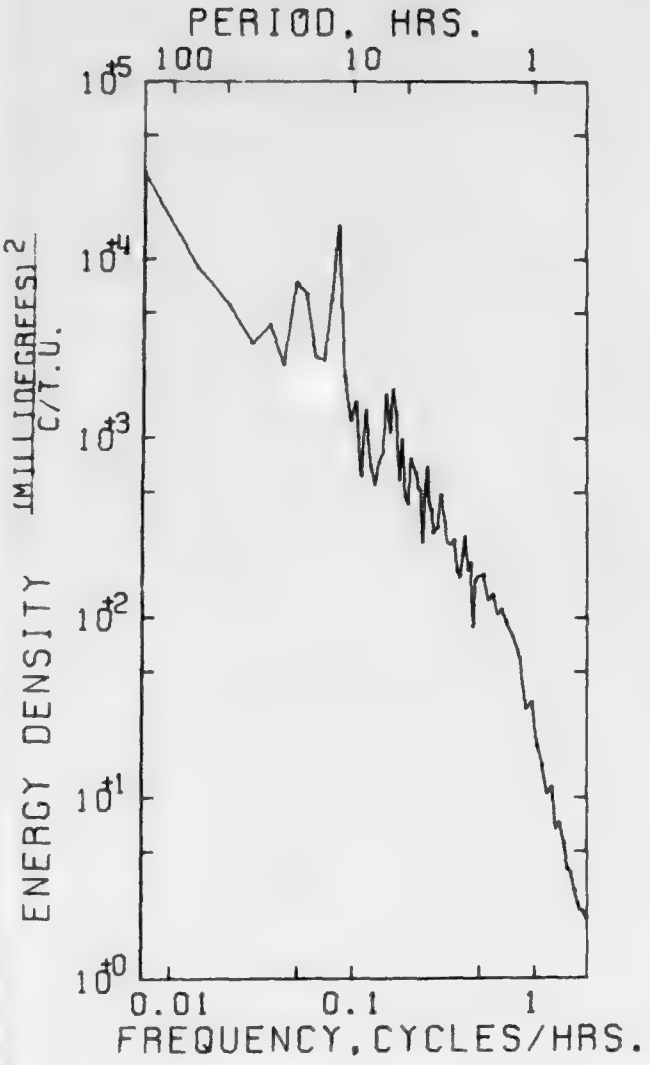
SPANNING RANGE
FROM 73- IV -04 16.37.00
TO 73- V -24 05.22.00

DURATION 48 DAYS 12 H 45 M

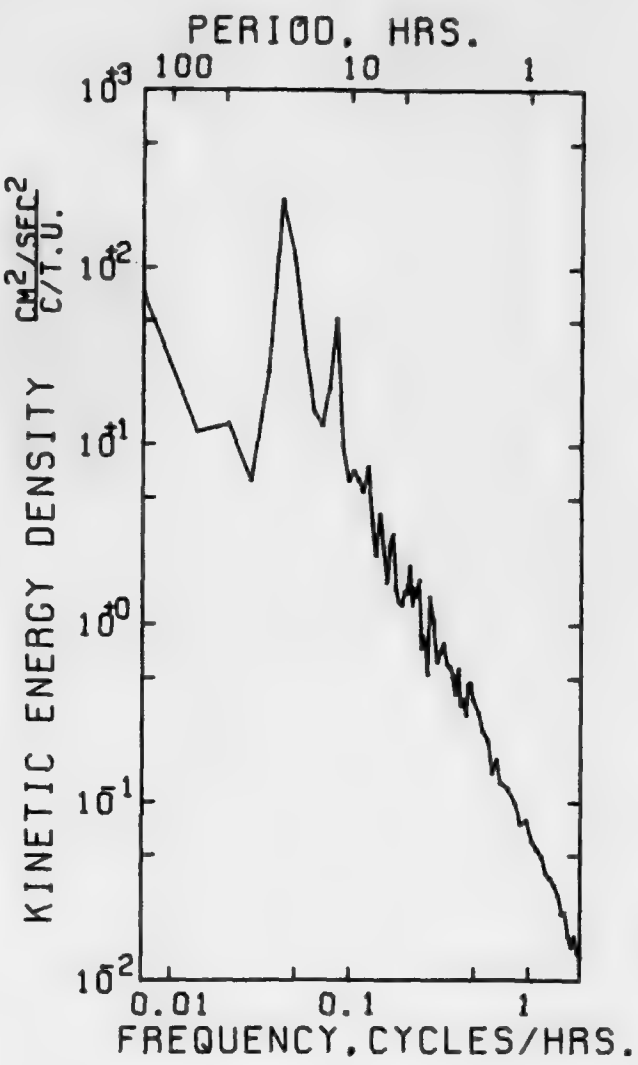
*** TEMPERATURE ***
*** DEGREES C. ***

MEAN =	4.549	STD ERR =	.001
VARIANCE =	.004		
STD. DEV. =	.063		
KURTOSIS =	2.521		
SKEWNESS =	-.690		

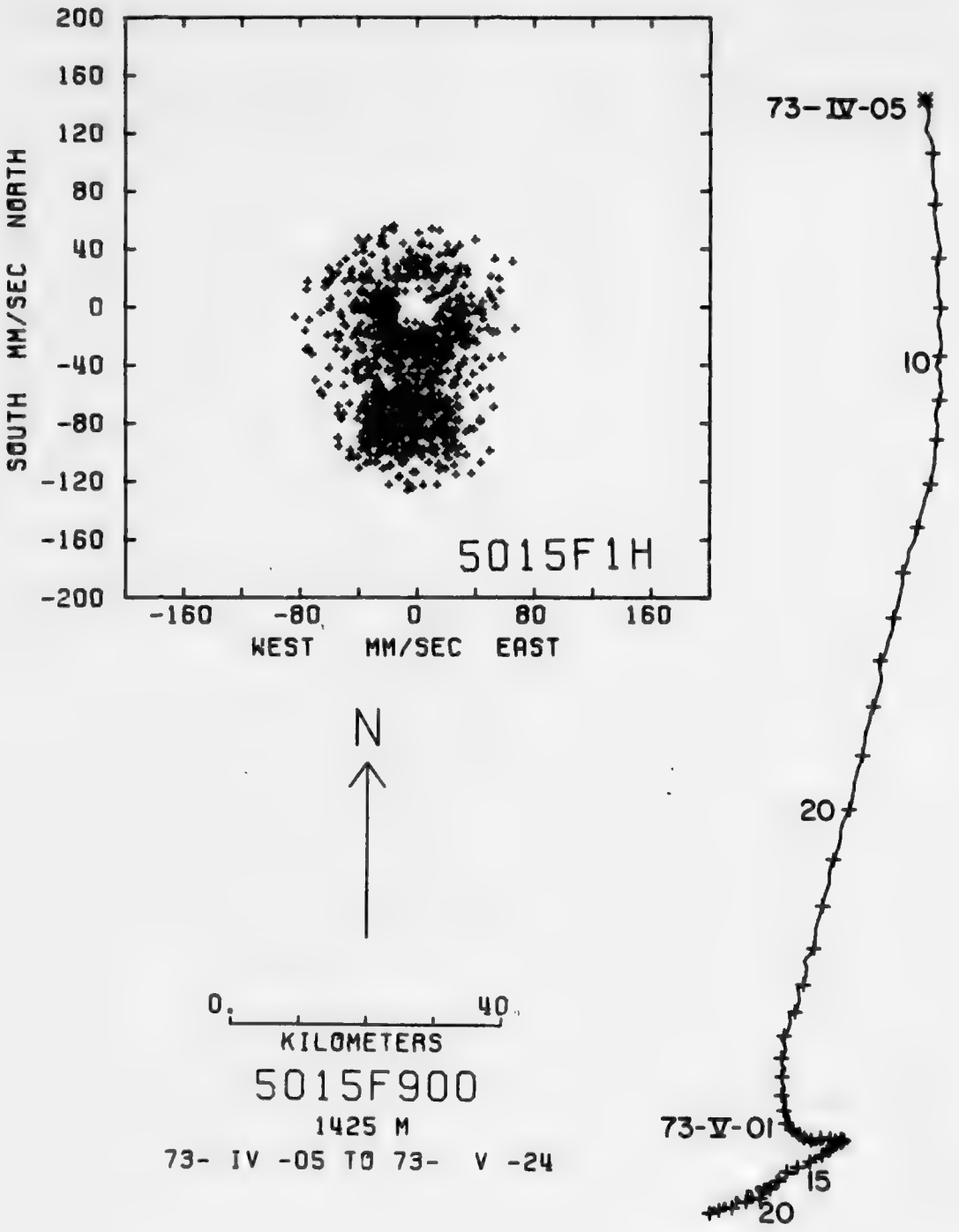
SAMPLE SIZE = 4756 POINTS

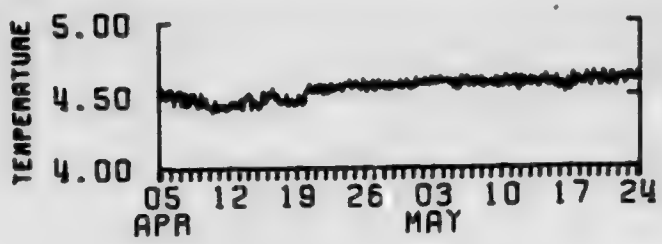


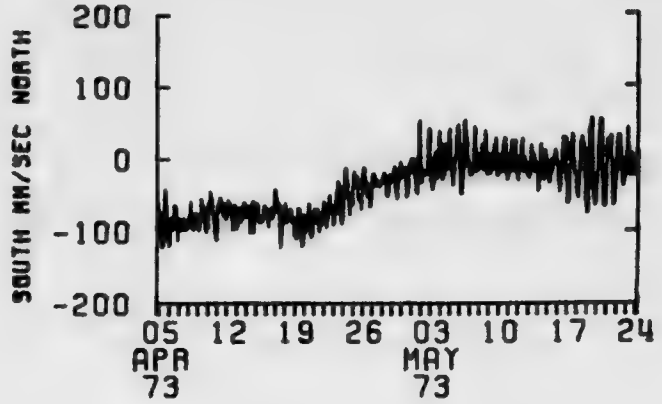
AUTO SPECTRUM
5015F900 TEMPERATURE
1425 METERS
73-IV-04 TO 73-V-21
1 PIECES WITH 2304 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS

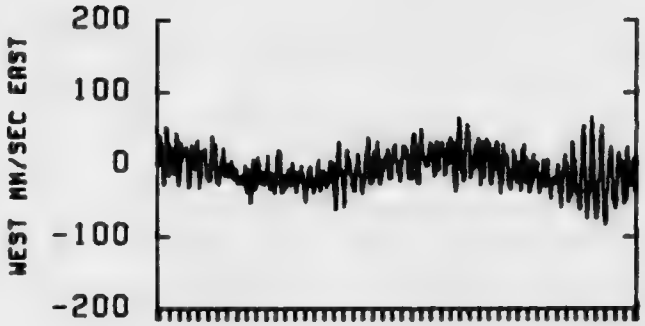


AUTO SPECTRUM
5015F900 EAST
5015F900 NORTH
1425 METERS
73-IV-04 TO 73-V-22
1 PIECES WITH 2304 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS


200
160
120
80
40
0
-40
-80
-120
-160
-200
SOUTH MM/SEC NORTH
5015F1H
-160
-80
0
80
160
WEST MM/SEC EAST
N
0
40
KILOMETERS
5015F900
1425 M
73- IV -05 TO 73- V -24
73-IV-05
10
20
73-V-01
15
20

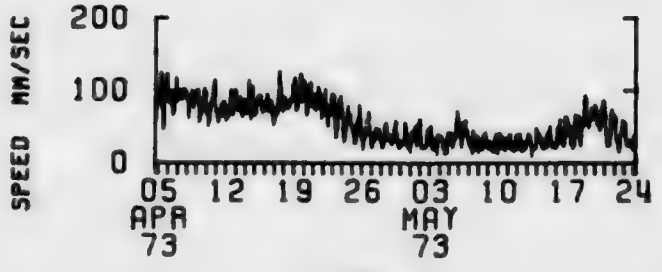






5015F1H

1425 M



DATA NUMBER 5016

Instrument No.: V-0204 Type: Vector Averaging Current Meter

Depth: 2936 m Water Depth: 5379 m

Start time: 73-April-05 07.07.30

Stop time: 73-April-21 06.07.30

Duration: 15d 23h

Sampling scheme: Vector Averaging Current Meter

recording interval = 900 seconds

COMMENTS:
Compass - good

Vane - good

Rotor - below threshold April 21 to June 9, suspicious June 9 to recovery

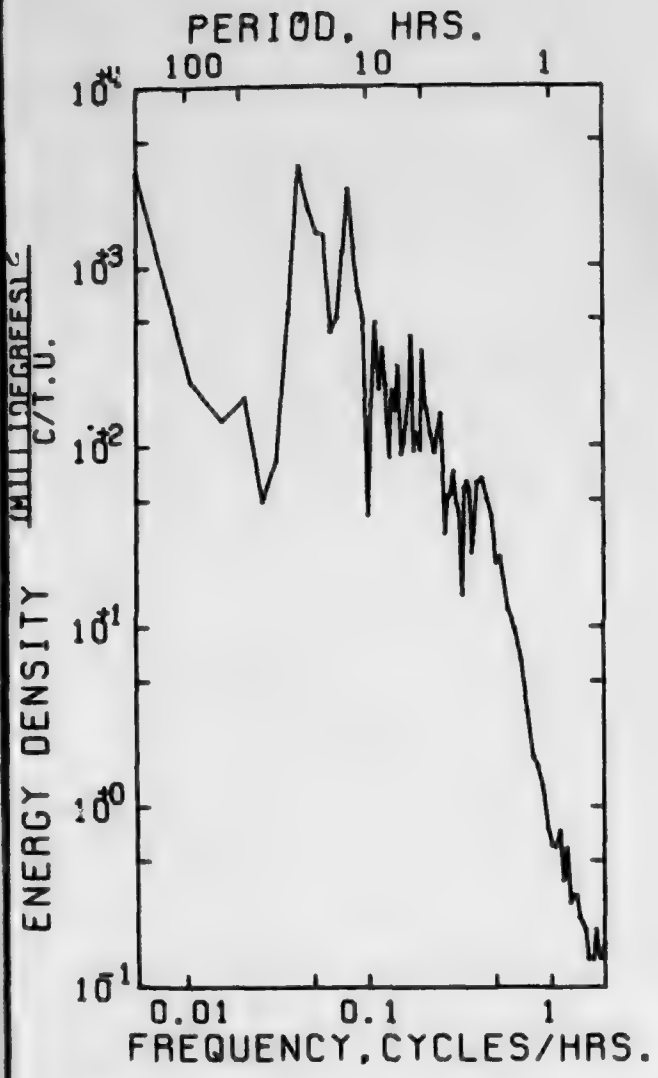
Temperature - good

DATA/ 5016A900

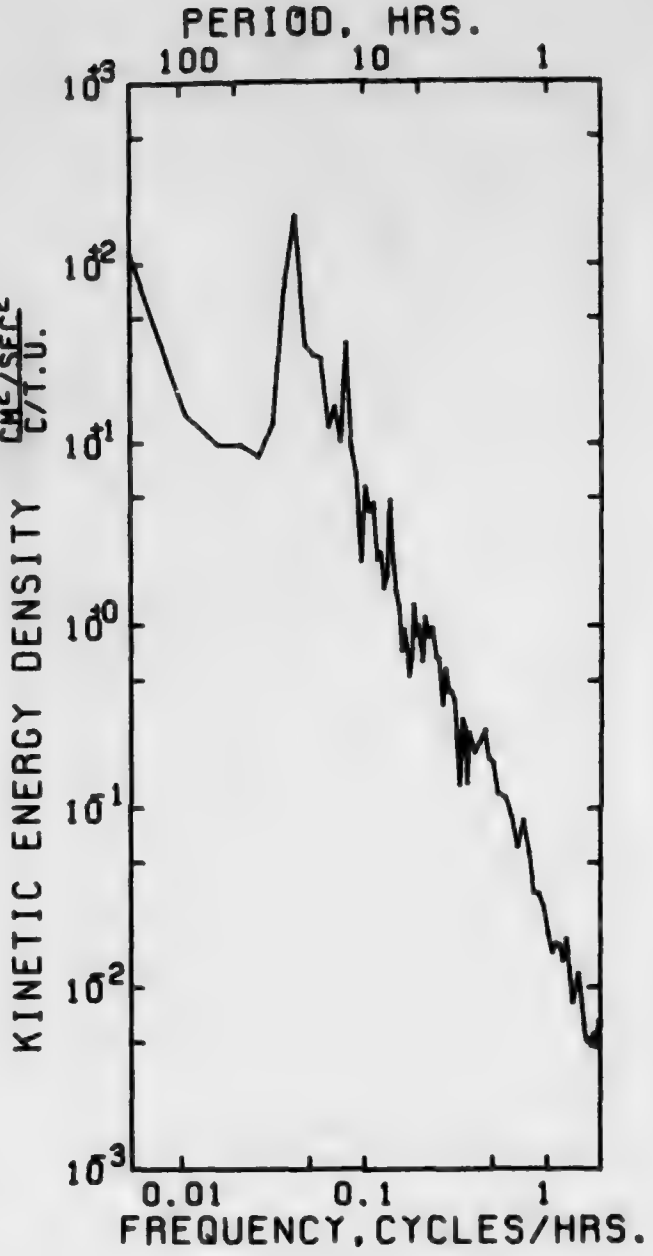
VARIABLE	EAST	NORTH	SPEED
UNITS	MM/SEC	MM/SEC	MM/SEC
MEAN	-28.728	-74.704	82.488
STD. ERR.	.488	.552	.517
VARIANCE	937.368	487.532	410.184
STD. DEV.	18.368	21.622	20.259
KURTOSIS	2.544	2.682	2.814
SKEWNESS	-.700E-1	.188	-.368
MINIMUM	-78.481	-128.000	20.000
MAXIMUM	15.412	-17.638	128.000

EAST & NORTH

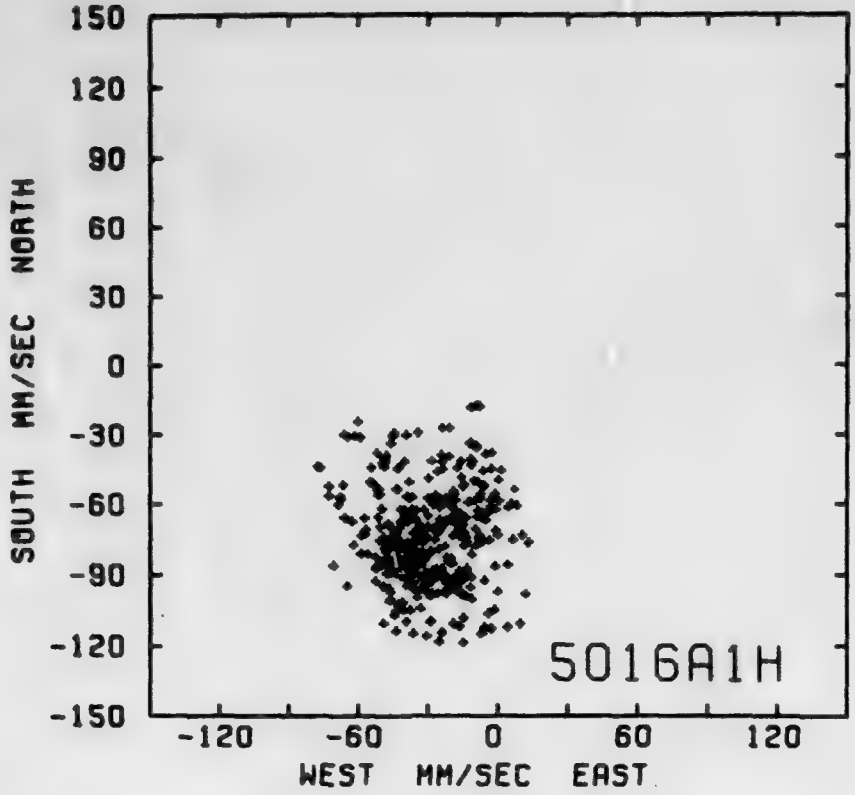
COVARIANCE	=	-34.872	= SAMPLE SIZE = 1593 POINTS
STD. ERR. OF COVARIANCE	=	38.342	=
STD. DEV. OF COVARIANCE	=	1422.937	= SPANNING RANGE
CORRELATION COEFFICIENT	=	-.881E-1	= FROM 73- IV -05 07.07.30
VECTOR MEAN	=	80.038	= TO 73- IV -21 06.07.30
VECTOR VARIANCE	=	402.450	=
VECTOR STD. DEV.	=	20.061	= DURATION 15.86 DAYS



AUTO SPECTRUM
5016A900 TEMPERATURE
2987 METERS
73-IV-05 TO 73-IV-20
1 PIECES WITH 750 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS



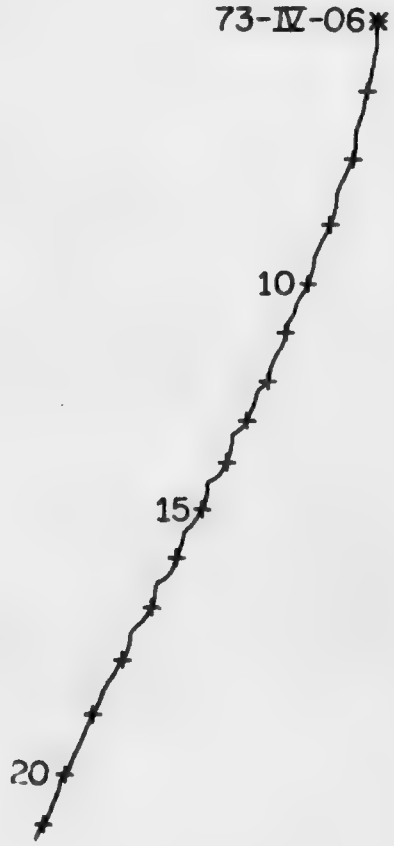
AUTO SPECTRUM
5016A900 EAST
5016A900 NORTH
2987 METERS
73-IV-05 TO 73-IV-20
1 PIECES WITH 750 ESTIMATES
PER PIECE. AVERAGED OVER
2 ADJACENT FREQUENCY BANDS

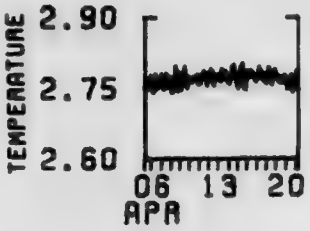


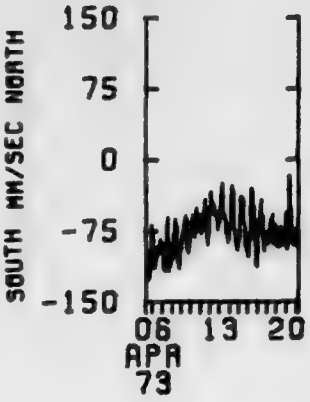
5016A900

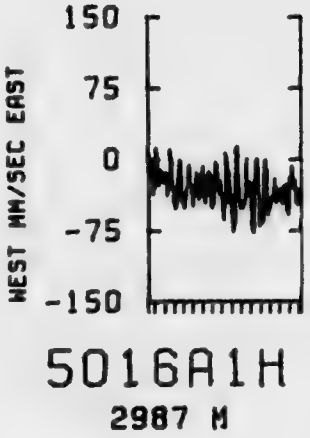
2987 M

73- IV -06 TO 73- IV -21




TEMPERATURE
2.90
2.75
2.60
06
13
20
APR


SOUTH MM/SEC NORTH
150
75
0
-75
-150
06
13
20
APR
73


WEST MM/SEC EAST
150
75
0
-75
-150
5016A1H
2987 M
DIRECTION
360
180
0
SPEED MM/SEC
150
75
0
06
13
20
APR
73

DATA NUMBER 5017

Instrument No.: M-175t

Type: Magnetic Tape Recording Current Meter

Depth: 3951 m

Water depth: 5379 m

Start time: 73-April-05 06.00.34.

Stop time: 73-June-30 12.30.34.

Duration: 86d 06h 30m

Sampling scheme: Interval

time between strobes = 5.27 seconds

no. of strobes per interval = 13

recording interval = 1800 seconds

COMMENTS:

Compass had a correctable bit problem

All variables look good for entire record

STATS DATA/ 501791800

	EAST	NORTH	SPEED	*****	EAST & NORTH	*****
MEAN =	-27.46	.02	44.61	= COVARIANCE	=	120.72
STD. ERR. =	.30	.57	.33	= STD. ERR. OF COVARIANCE	=	21.03
VARIANCE =	381.58	1991.68	458.84	= STD. DEV. OF COVARIANCE	=	1353.47
STD. DEV. =	18.53	38.48	21.42	= CORRELATION COEFFICIENT	=	.182
KURTOSIS =	3.18	2.88	3.05	= VECTOR MEAN	=	27.45
SKEWNESS =	-.28	-.87	.68	= VECTOR VARIANCE	=	858.69
				= STD. DEV.	=	29.27

UNITS OF RAW DATA VARIABLES = KN/SEC

SAMPLE SIZE = 4142 POINTS

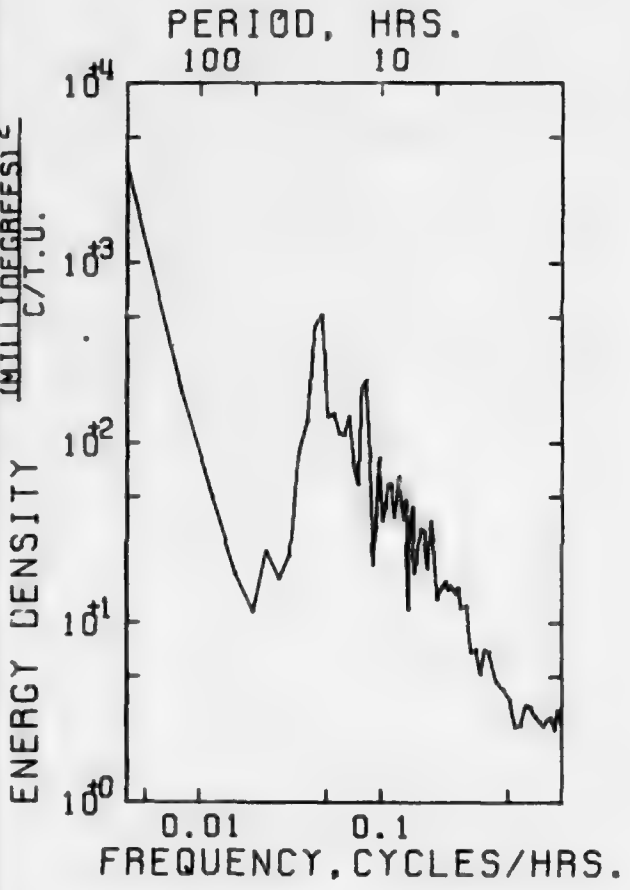
SPANNING RANGE
FROM 73- IV -05 06.00.34
TO 73- VI -30 12.30.34

DURATION 86 DAYS 6 H 30 M

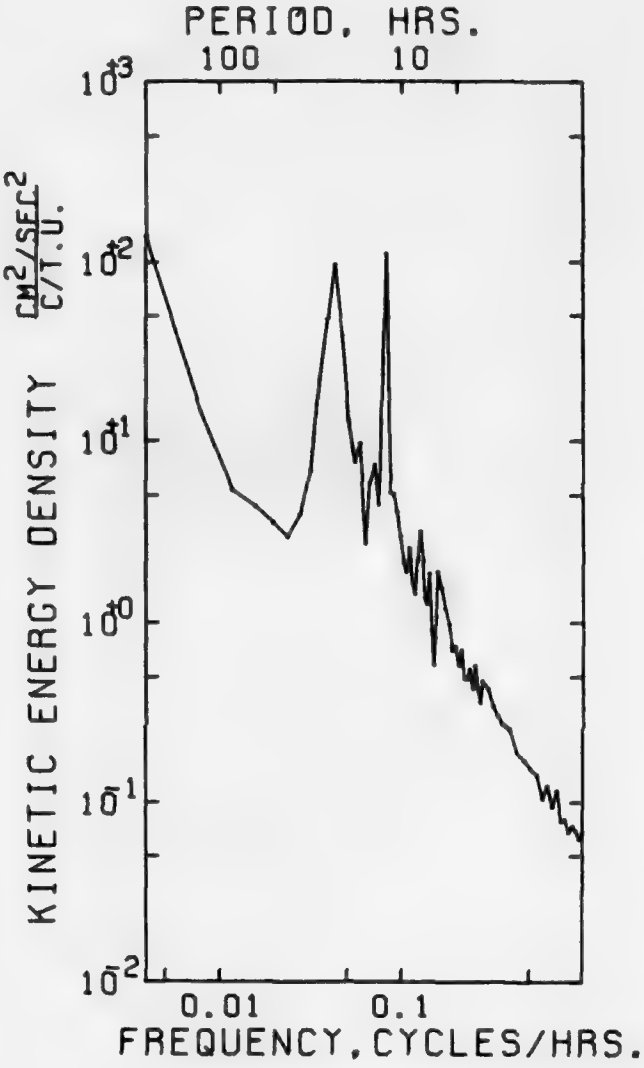
*** TEMPERATURE ***
*** DEGREES C. ***

MEAN = 2.336 STD ERR = .000
VARIANCE = .000
STD. DEV. = .007
KURTOSIS = 3.194
SKEWNESS = .022

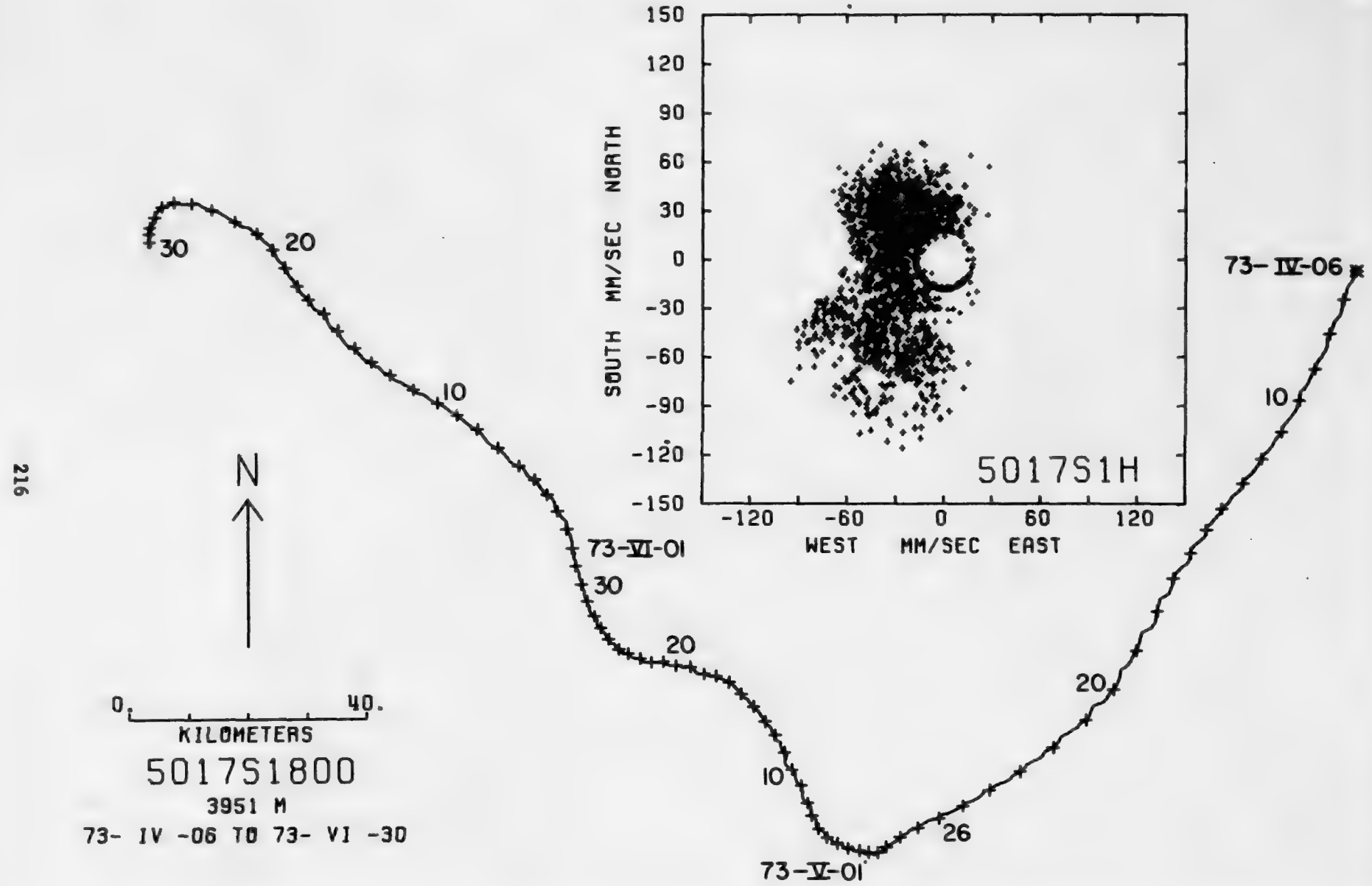
SAMPLE SIZE = 4142 POINTS



AUTO SPECTRUM
5017S1800 TEMPERATURE
3951 METERS
73-IV-05 TO 73-VI-29
1 PIECES WITH 2048 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS



AUTO SPECTRUM
5017S1800 EAST
5017S1800 NORTH
3951 METERS
73-IV-05 TO 73-VI-29
1 PIECES WITH 2048 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS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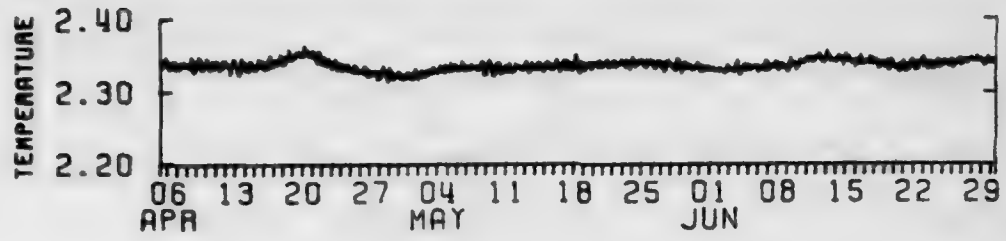
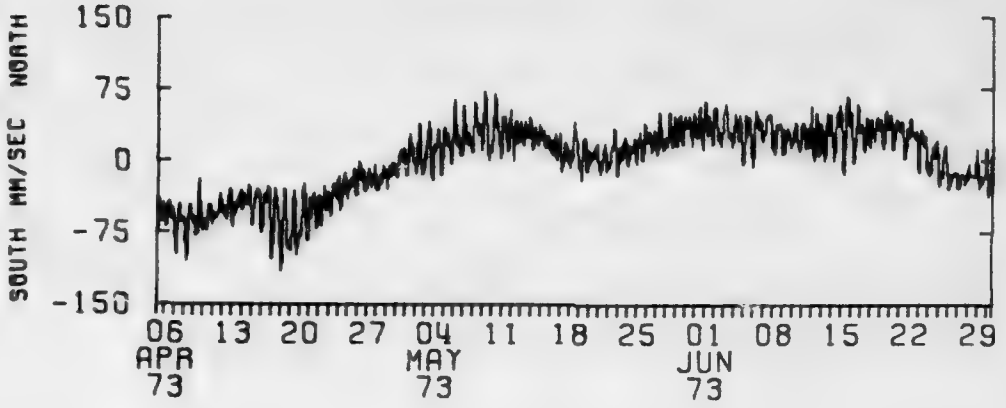
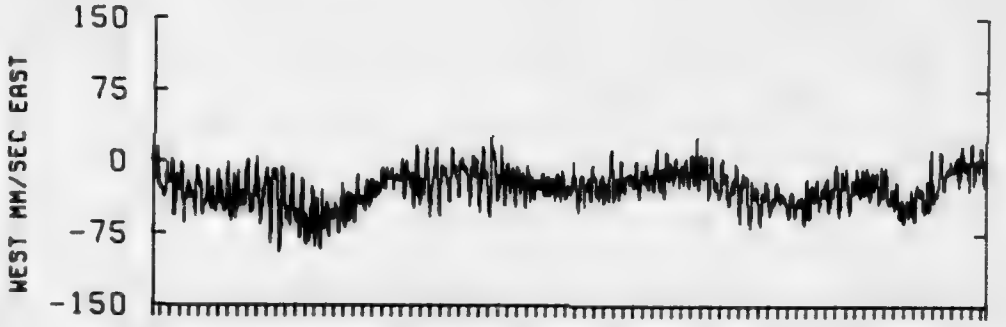
120
90
60
30
0
-30
-60
-90
-120
-150
SOUTH MM/SEC NORTH
-120
-60
0
60
120
WEST MM/SEC EAST
5017S1H
73-IV-06
30
20
10
73-VI-01
30
20
10
73-V-01
20
26
N
0.
40.
KILOMETERS
5017S1800
3951 M
73- IV -06 TO 73- VI -30

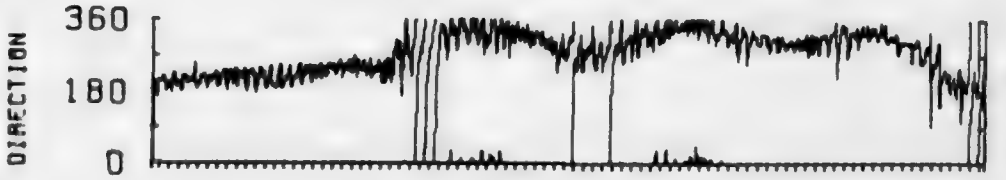


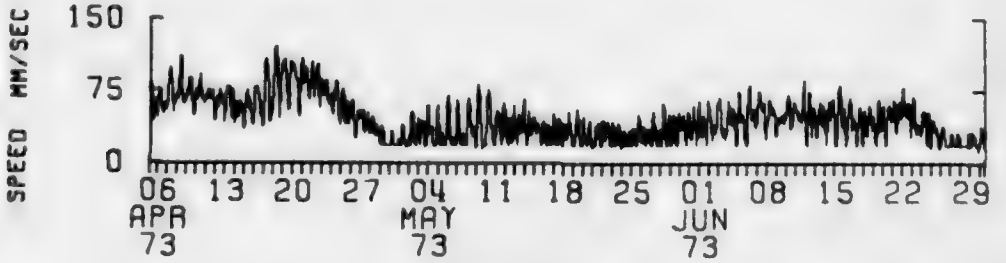




5017S1H

3951 M





DATA NUMBER 5018

Instrument No.: M-284 Type: Magnetic Tape Recording Current Meter

Depth: 5279 m Water depth: 5379 m

Start time: 73-April-04 15.10.37.

Stop time: 73-June-30 11.40.37.

Duration: 86d 20h 30m

Sampling scheme: Interval

time between strobes = 5.27seconds

no. of strobes per interval = 13

recording interval = 1800seconds

COMMENTS:

Instrument owned by the University of Rhode Island

All variables good for entire record

STATS DATA/ 5018F1800

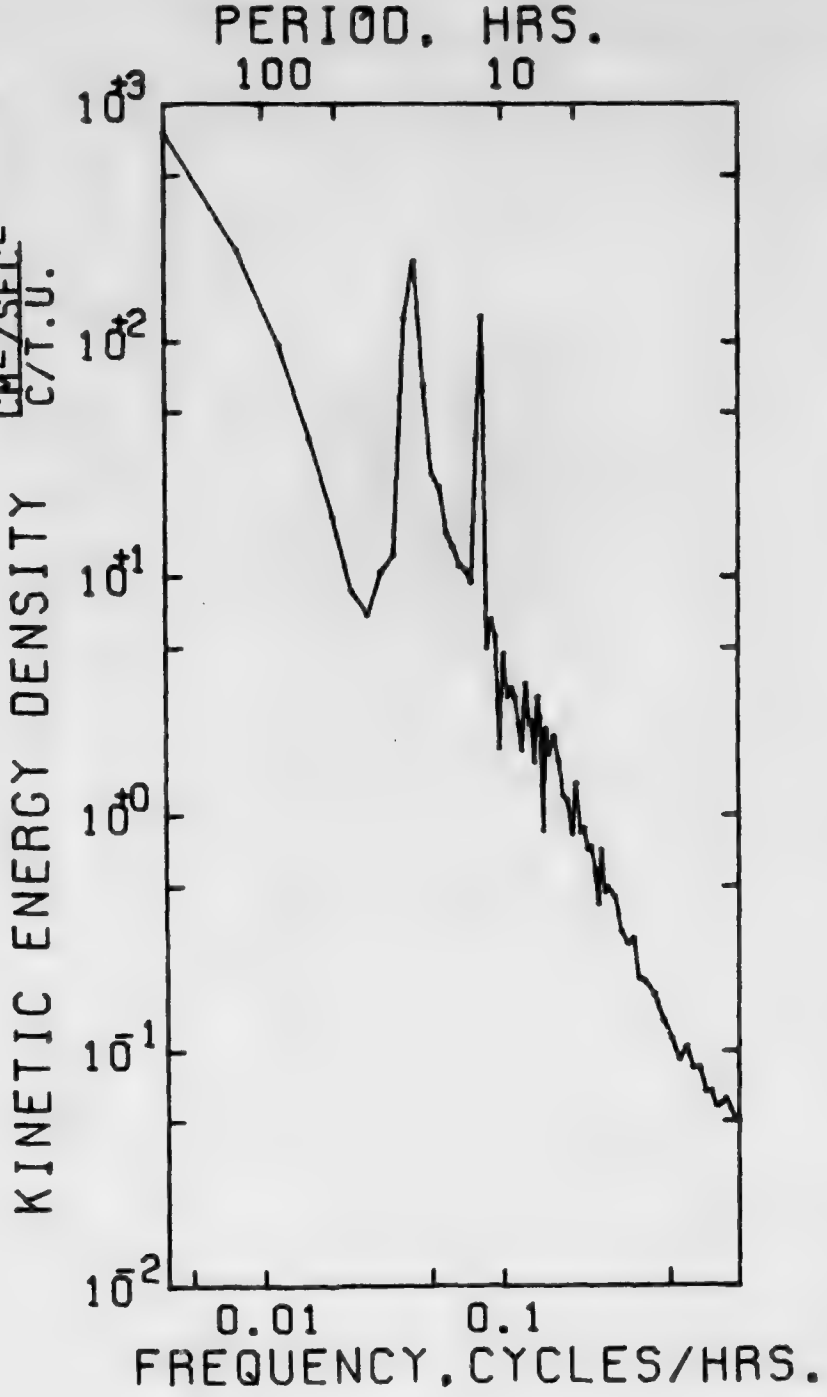
	EAST	NORTH	SPEED			
MEAN =	-27.86	5.59	50.67	*	****** EAST & NORTH	******
STD. ERR. =	.52	.54	.37	*	COVARIANCE =	80.50
VARIANCE =	1111.91	1251.06	571.60	*	STD. ERR. OF COVARIANCE =	23.84
STD. DEV. =	33.35	35.09	23.91	*	STD. DEV. OF COVARIANCE =	1545.64
KURTOSIS =	2.83	3.10	3.39	*	CORRELATION COEFFICIENT =	.069
SKEWNESS =	.05	-.09	.78	*	VECTOR MEAN =	28.21
				*	VECTOR VARIANCE =	1171.48
				*	STD. DEV. =	34.23

UNITS OF RAW DATA VARIABLES = MM/SEC

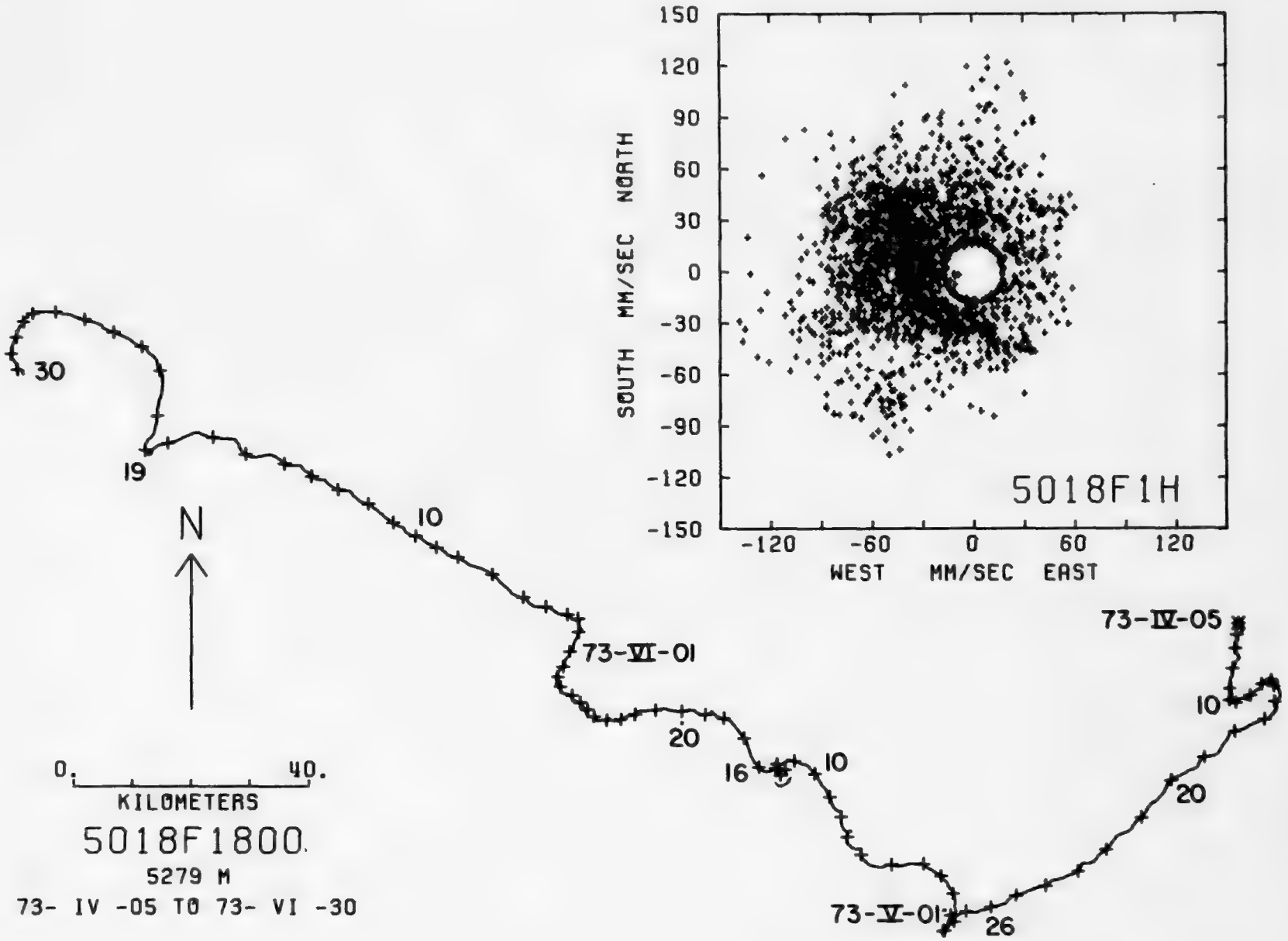
SAMPLE SIZE = 4170 POINTS

SPANNING RANGE
FROM 73- IV -04 15.10.37
TO 73- VI -30 11.40.37

DURATION 86 DAYS 20 H 30 M 0 S



AUTO SPECTRUM
5018F1800 EAST
5018F1800 NORTH
5279 METERS
73-IV-04 TO 73-VI-28
1 PIECES WITH 2048 ESTIMATES
PER PIECE. AVERAGED OVER
8 ADJACENT FREQUENCY BANDS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120
90
60
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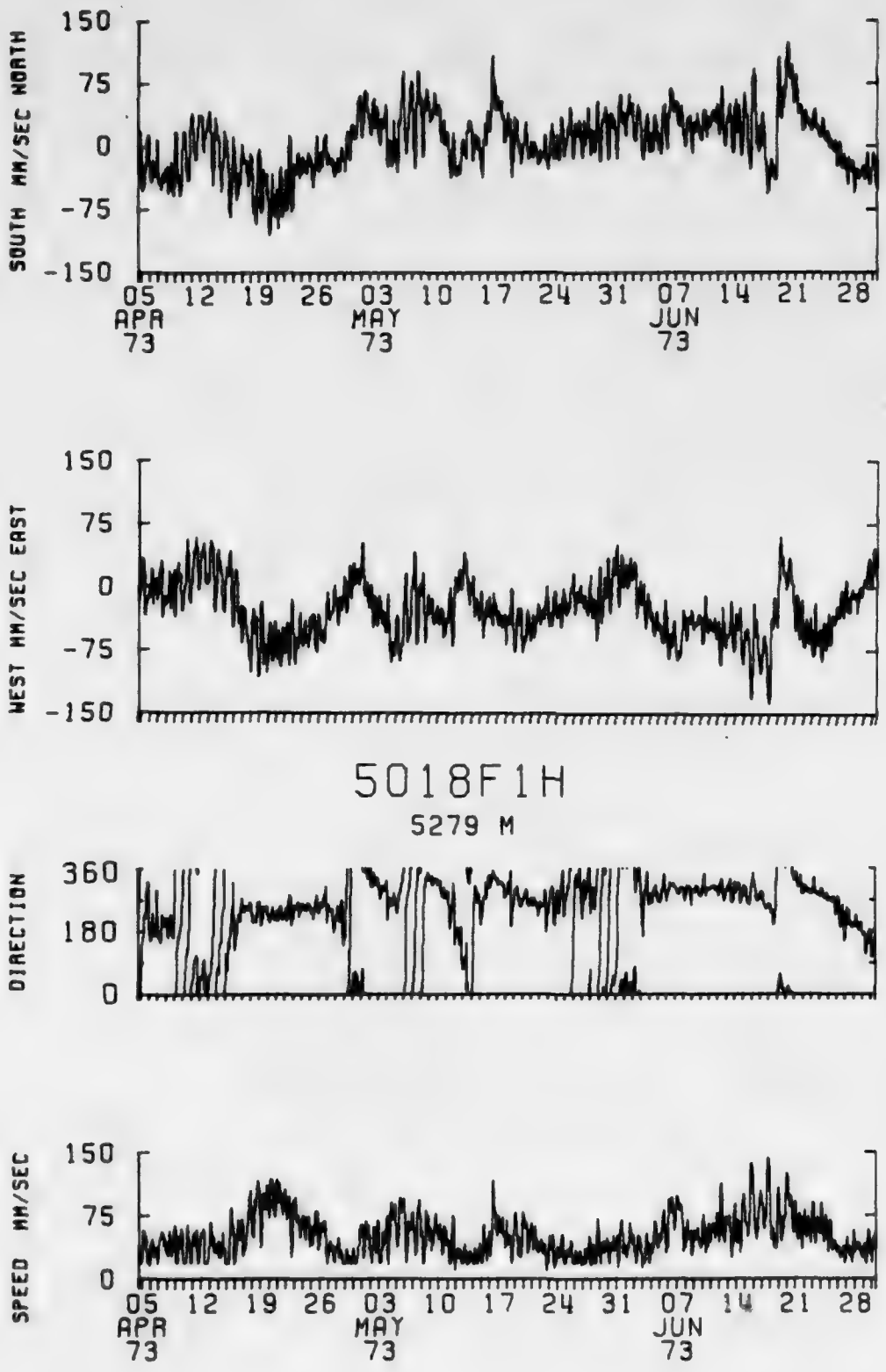
0
-30
-60
-90
-120
-150
SOUTH MM/SEC NORTH
-120
-60
0
60
120
WEST MM/SEC EAST
5018F1H
30
19
10
N
73-VI-01
20
16
10
73-V-01
26
73-IV-05
10
20
0.
40.
KILOMETERS
5018F1800.
5279 M
73- IV -05 TO 73- VI -30


SOUTH MM/SEC NORTH
150
75
0
-75
-150
05 12 19 26 03 10 17 24 31 07 14 21 28
APR 73
MAY 73
JUN 73
WEST MM/SEC EAST
150
75
0
-75
-150
5018F1H
5279 M
DIRECTION
360
180
0
SPEED MM/SEC
150
75
0
05 12 19 26 03 10 17 24 31 07 14 21 28
APR 73
MAY 73
JUN 73

Data Section 2

	Page
Temperature and Pressure Plotted by Mooring	224
U, V Vector Components Plotted by Mooring (Stick Plot)	258
U, V Vector Components Plotted by Depth	274

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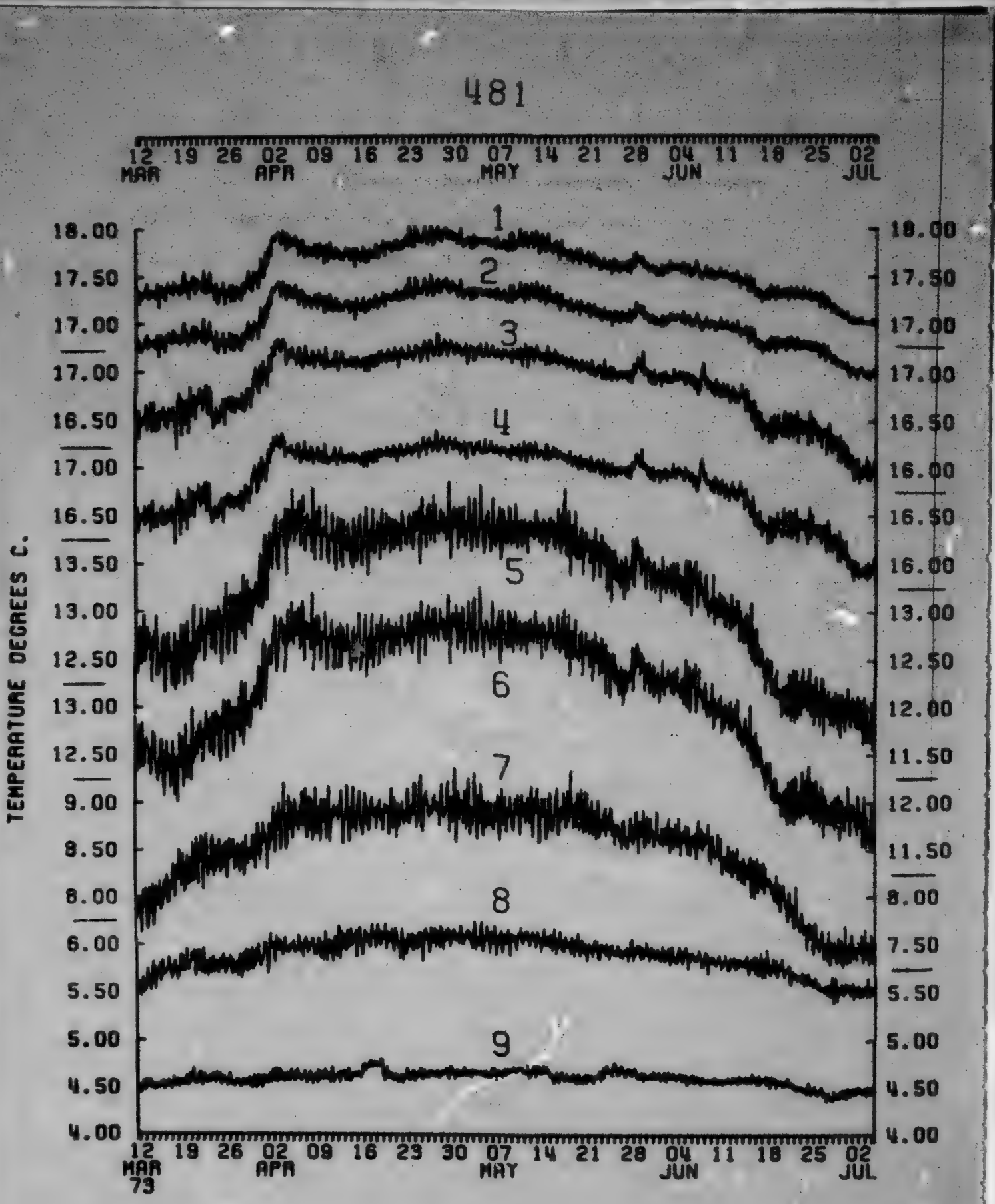
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12 19 26 02 09 16 23 30 07 14 21 28 04 11 18 25 02
MAR APR MAY JUN JUL
1
2
3
4
5
6
7
8
9
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17.50
17.00
17.00
16.50
17.00
16.50
13.50
13.00
12.50
13.00
12.50
9.00
8.50
8.00
6.00
5.50
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TEMPERATURE DEGREES C.
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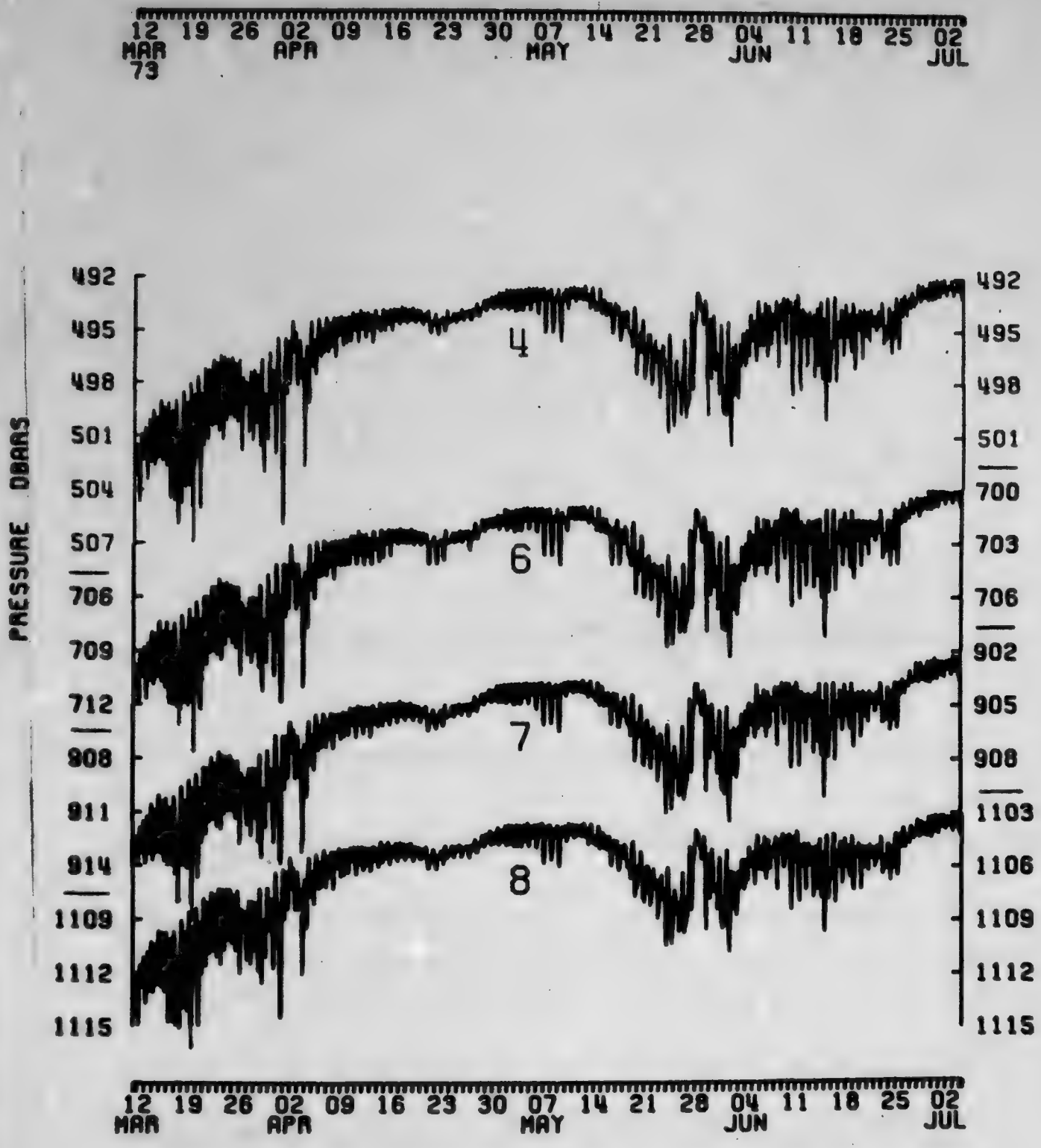
MAR APR MAY JUN JUL
73

481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MAR 73
APR
MAY
JUN
JUL
PRESSURE DBARS
492
495
498
501
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507
706
709
712
908
911
914
1109
1112
1115
4
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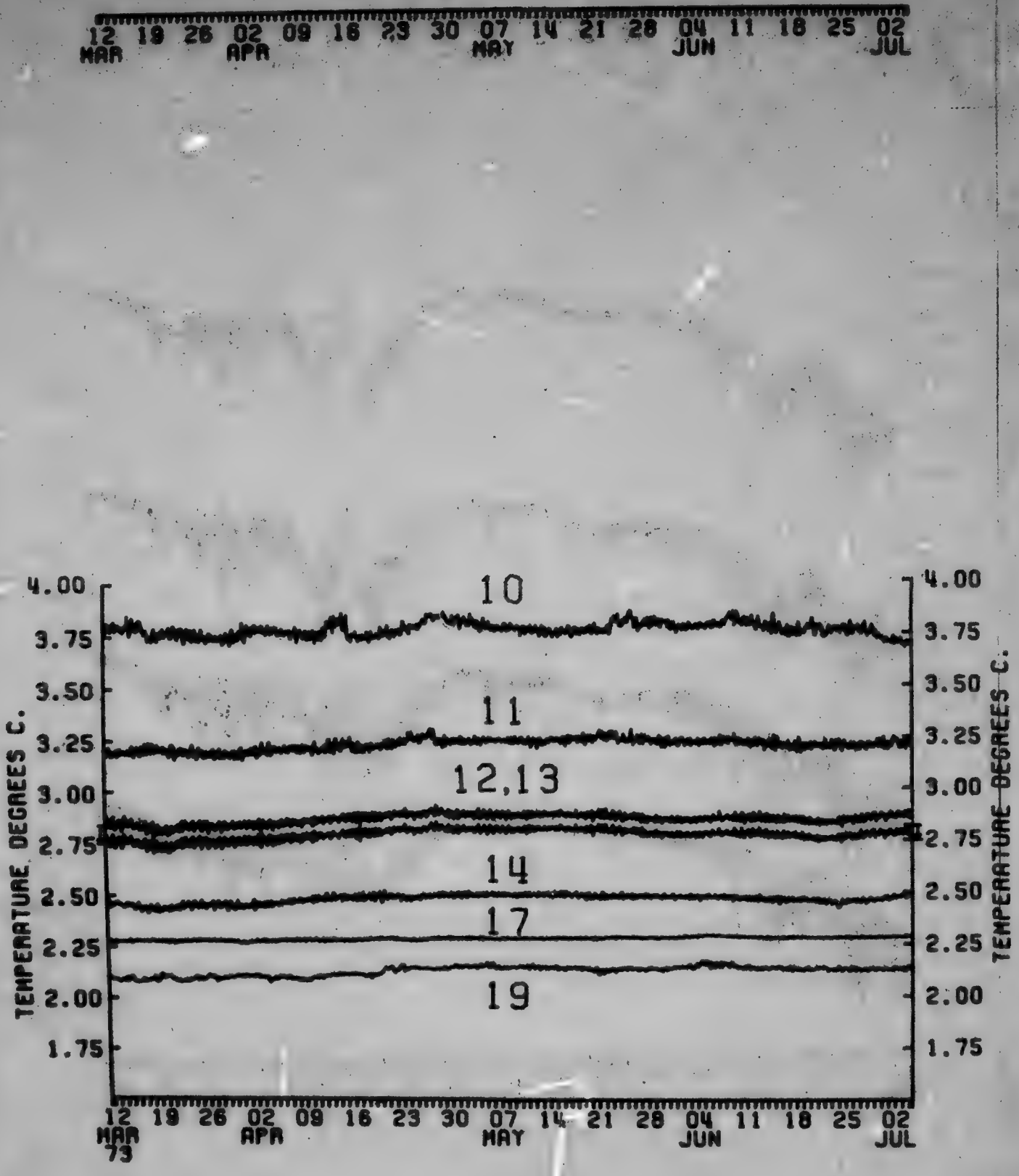
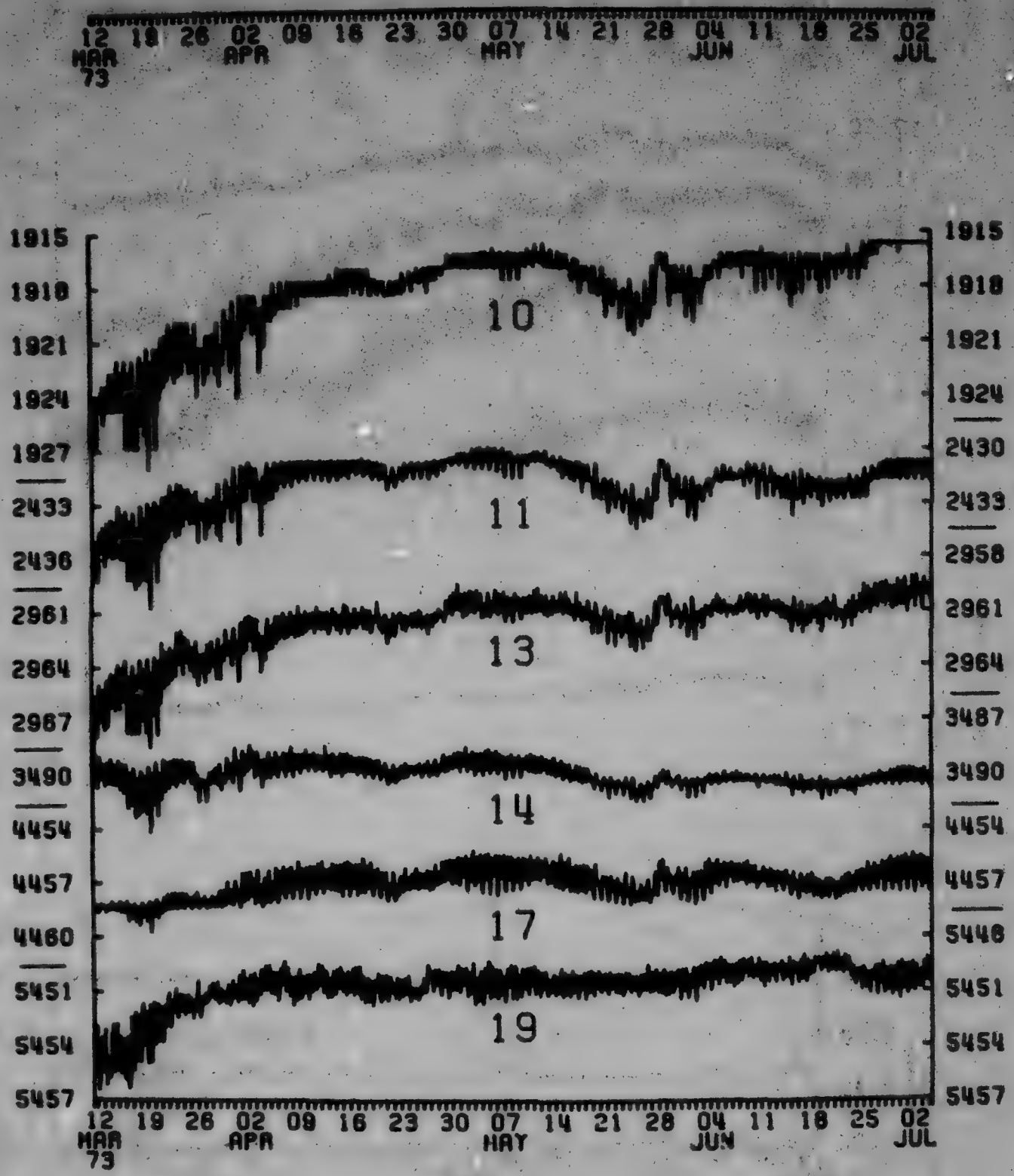

12 19 26 02 09 16 23 30 07 14 21 28 04 11 18 25 02
MAR
APR
MAY
JUN
JUL
10
11
12,13
14
17
19
4.00
3.75
3.50
3.25
3.00
2.75
2.50
2.25
2.00
1.75
TEMPERATURE DEGREES C.
TEMPERATURE DEGREES C.
12 19 26 02 09 16 23 30 07 14 21 28 04 11 18 25 02
MAR
73
APR
MAY
JUN
JUL


481
12 19 26 02 09 16 23 30 07 14 21 28 04 11 18 25 02
MAR 73
APR
MAY
JUN
JUL
PRESSURE DBARS
1915
1918
1921
1924
1927
2433
2436
2961
2964
2967
3490
4454
4457
4460
5451
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1915
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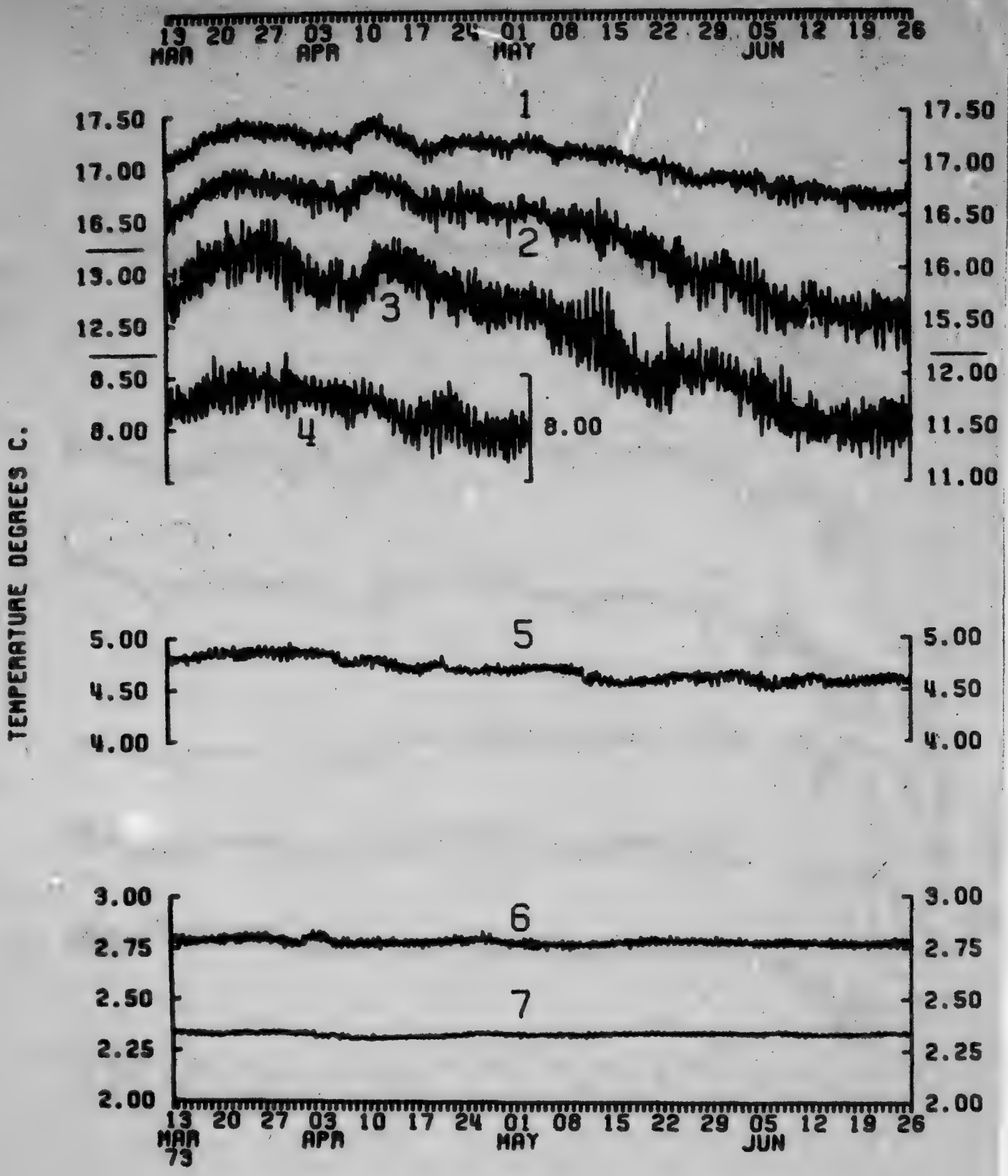
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MAR
APR
MAY
JUN
1
2
3
4
5
6
7
17.50
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15.50
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11.50
11.00
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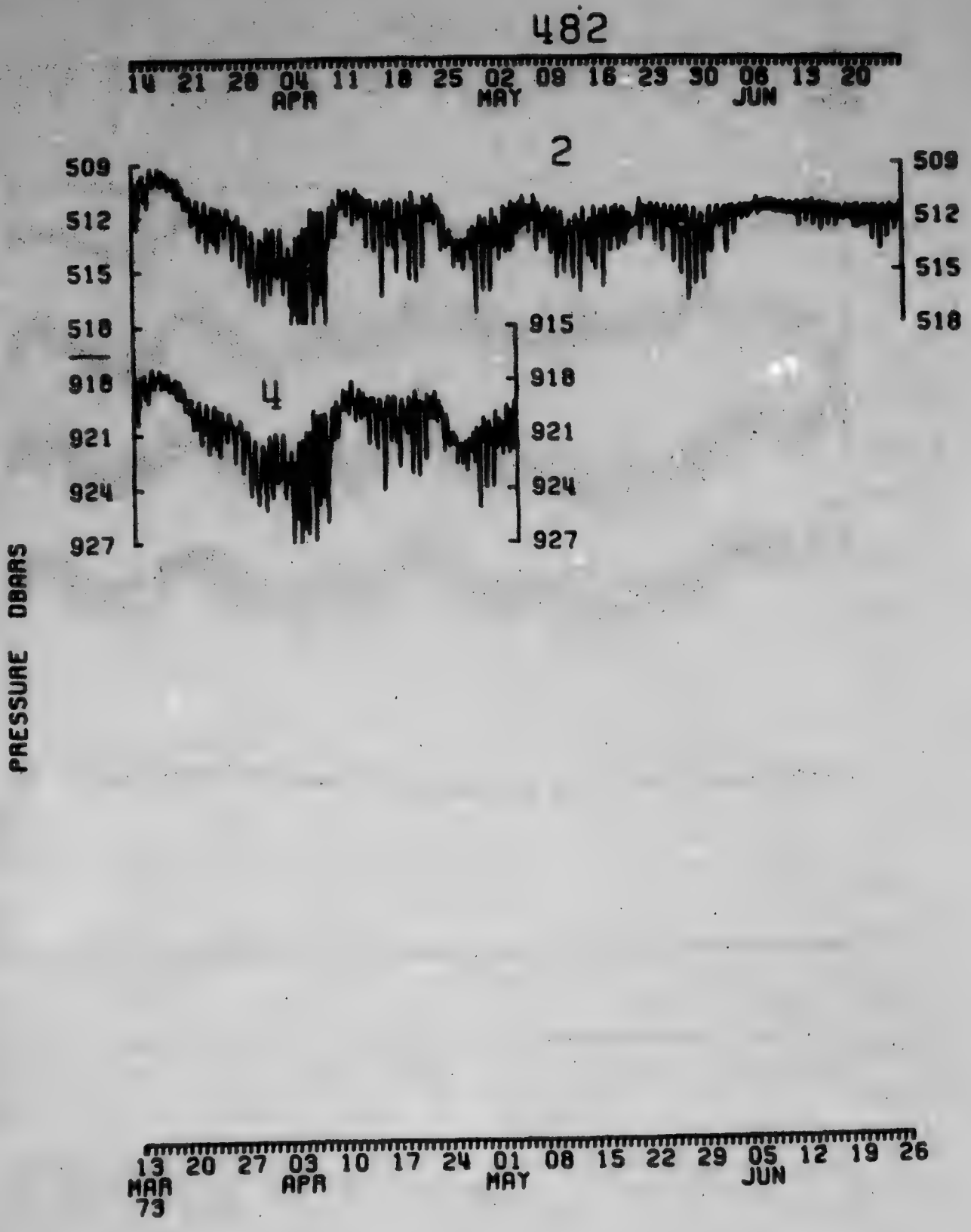
TEMPERATURE DEGREES C.
MAR 73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MAY
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921
924
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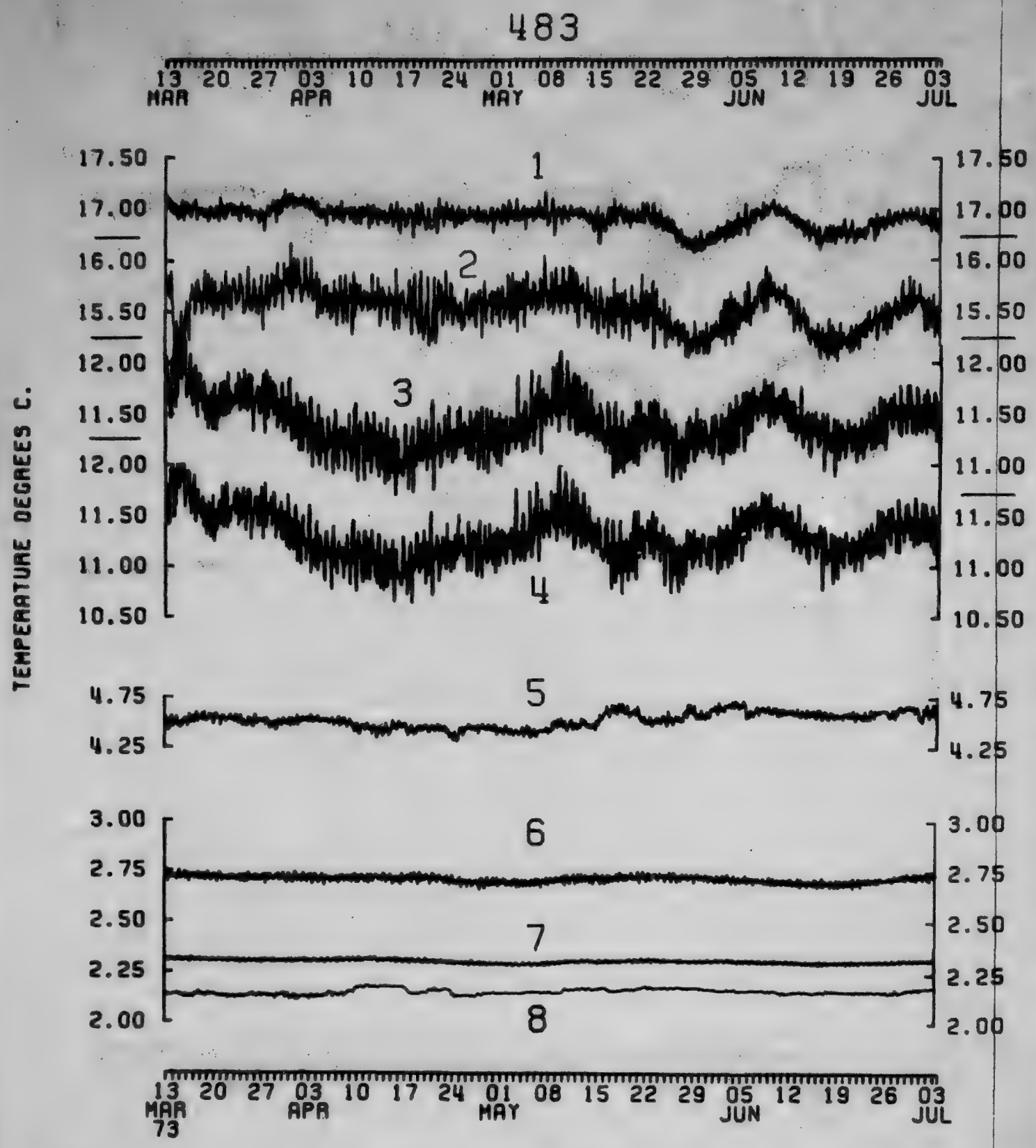
MAR
73
APR
MAY
JUN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13 20 27 03 10 17 24 01 08 15 22 29 05 12 19 26 03
MAR APR MAY JUN JUL
TEMPERATURE DEGREES C.
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17.00
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15.50
12.00
11.50
12.00
11.50
11.00
10.50
1
2
3
4
4.75
4.25
5
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2.00
6
7
8
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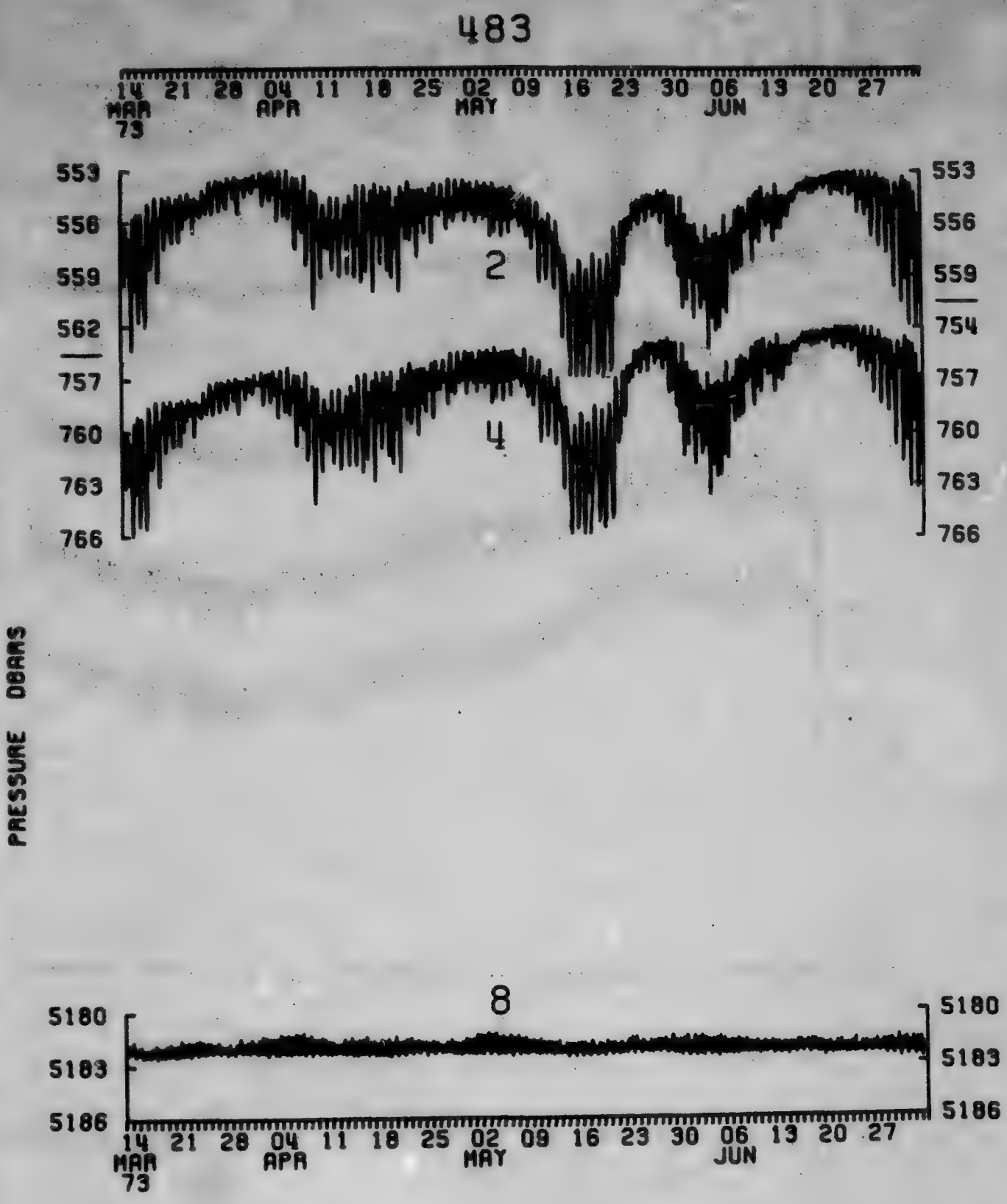
MAR 73 APR MAY JUN JUL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APR
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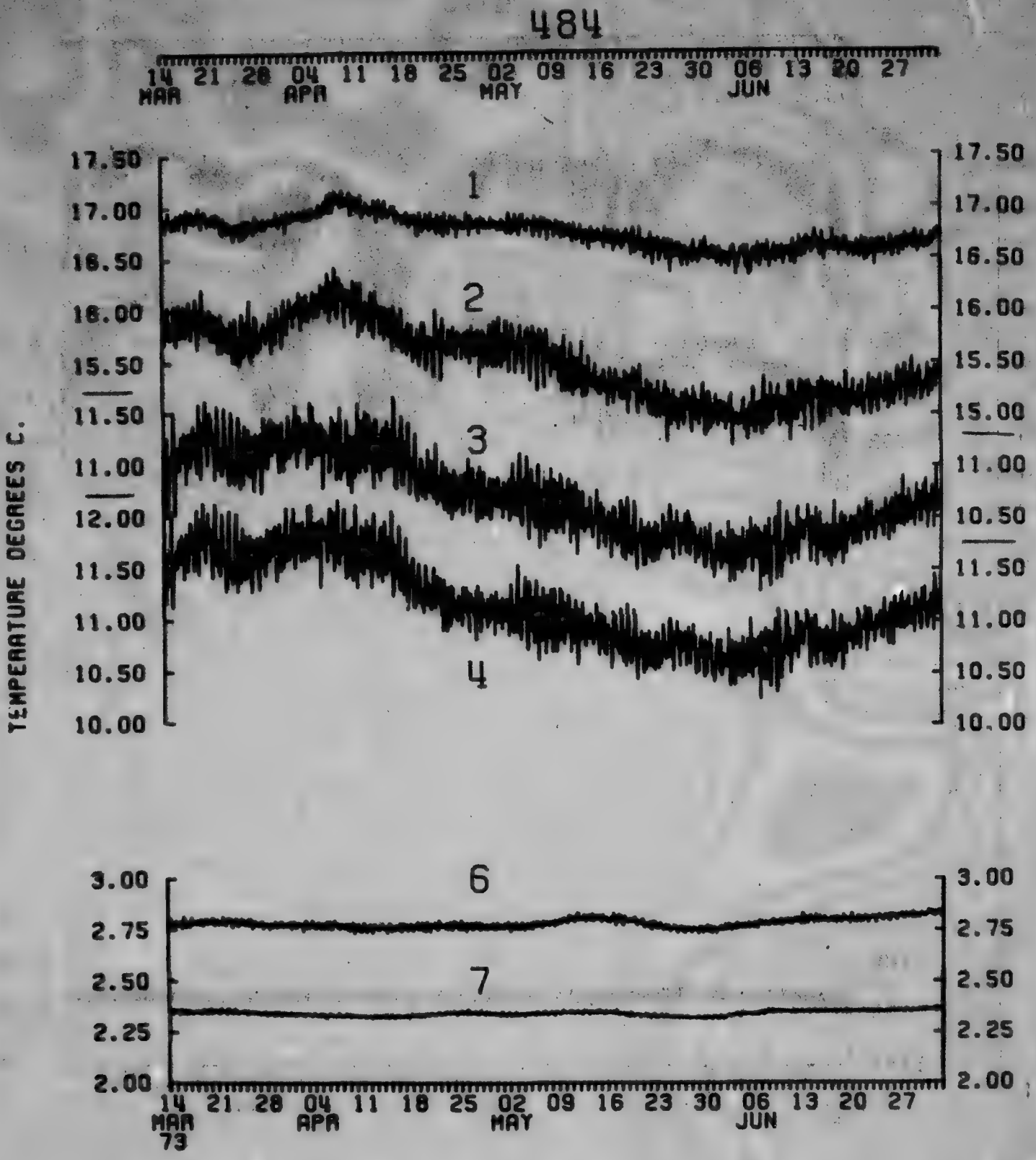
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12.00
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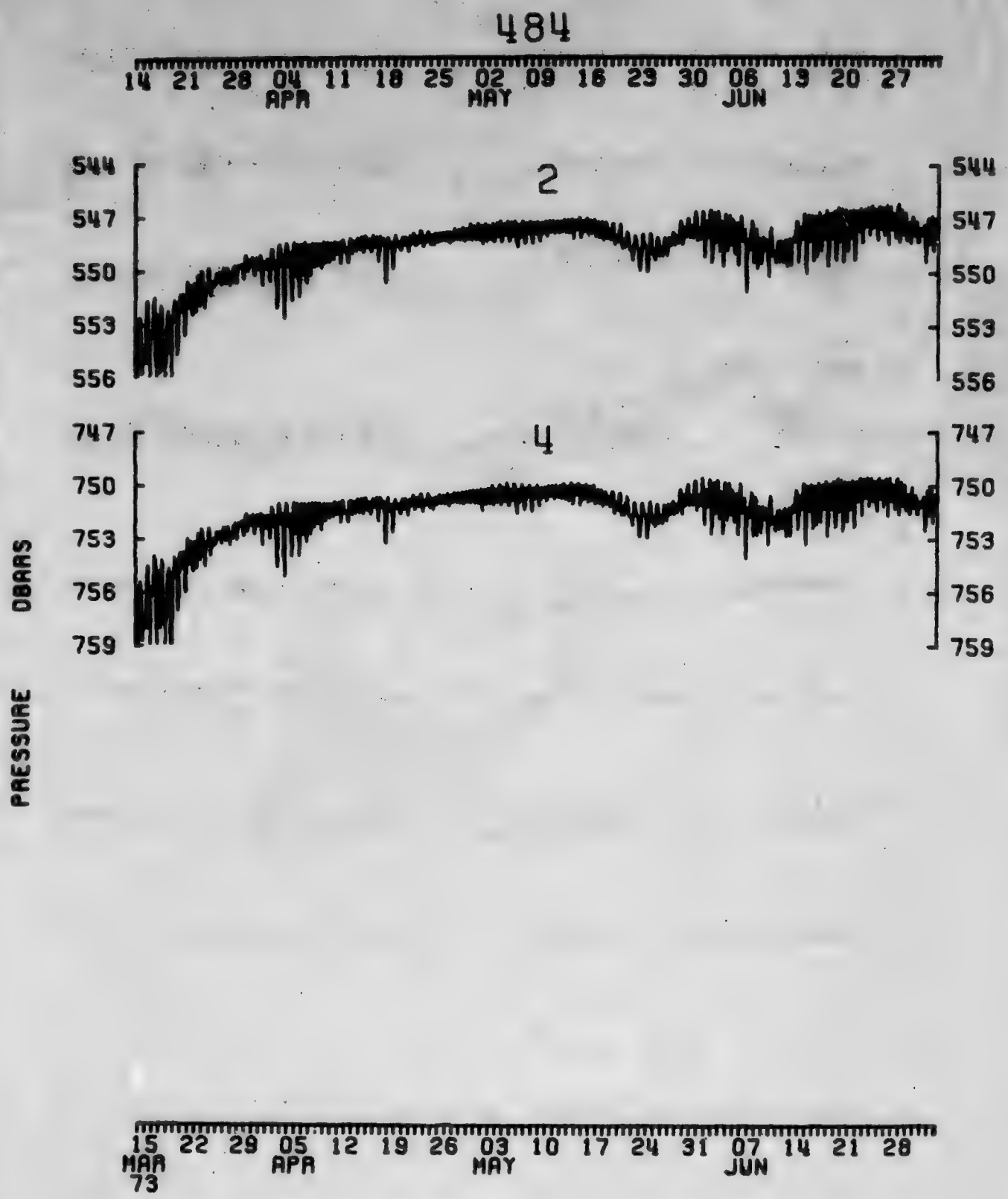
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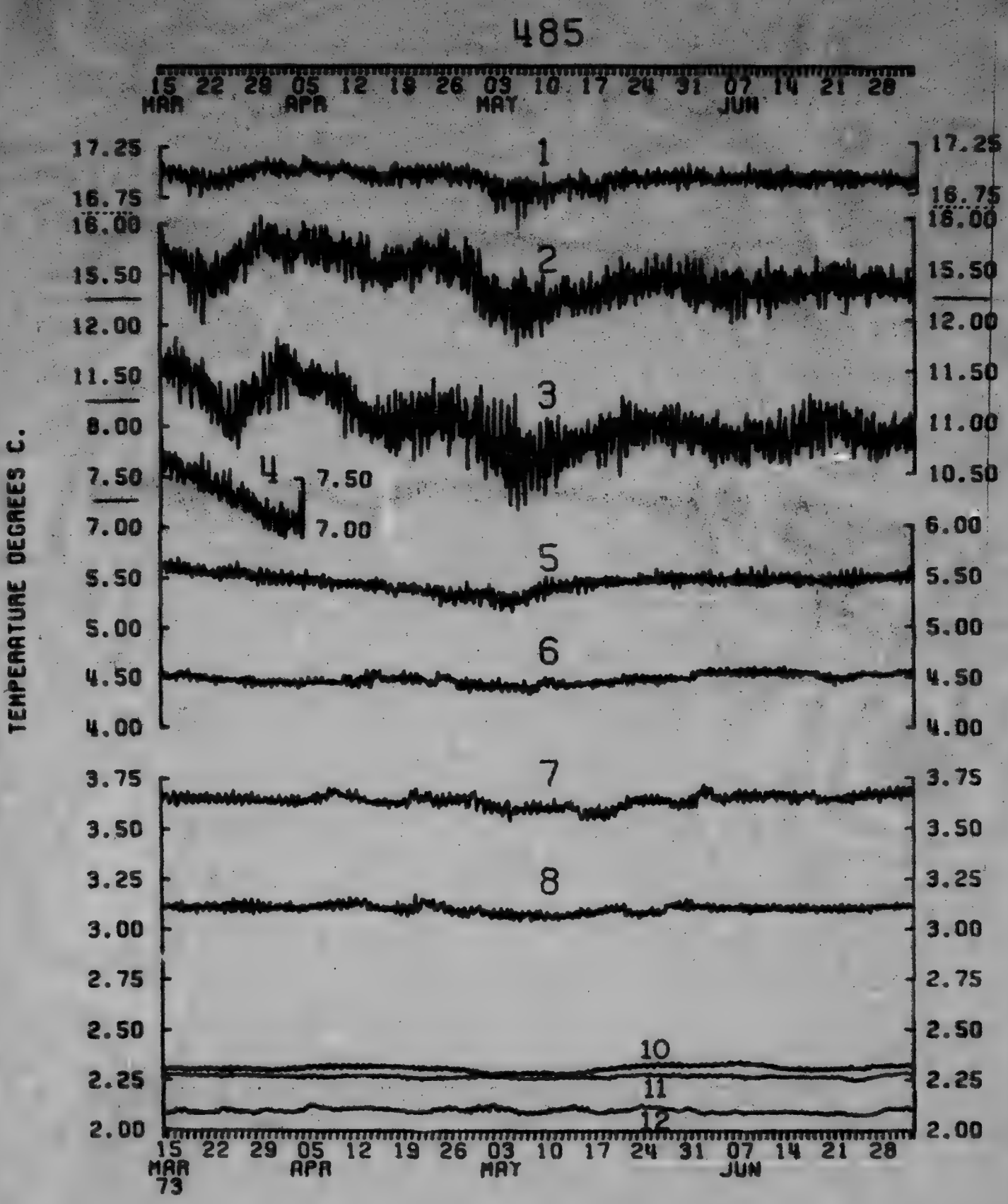
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JUN
TEMPERATURE DEGREES C.
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15.50
12.00
11.50
8.00
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7.00
5.50
5.00
4.50
4.00
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6.00
MAR
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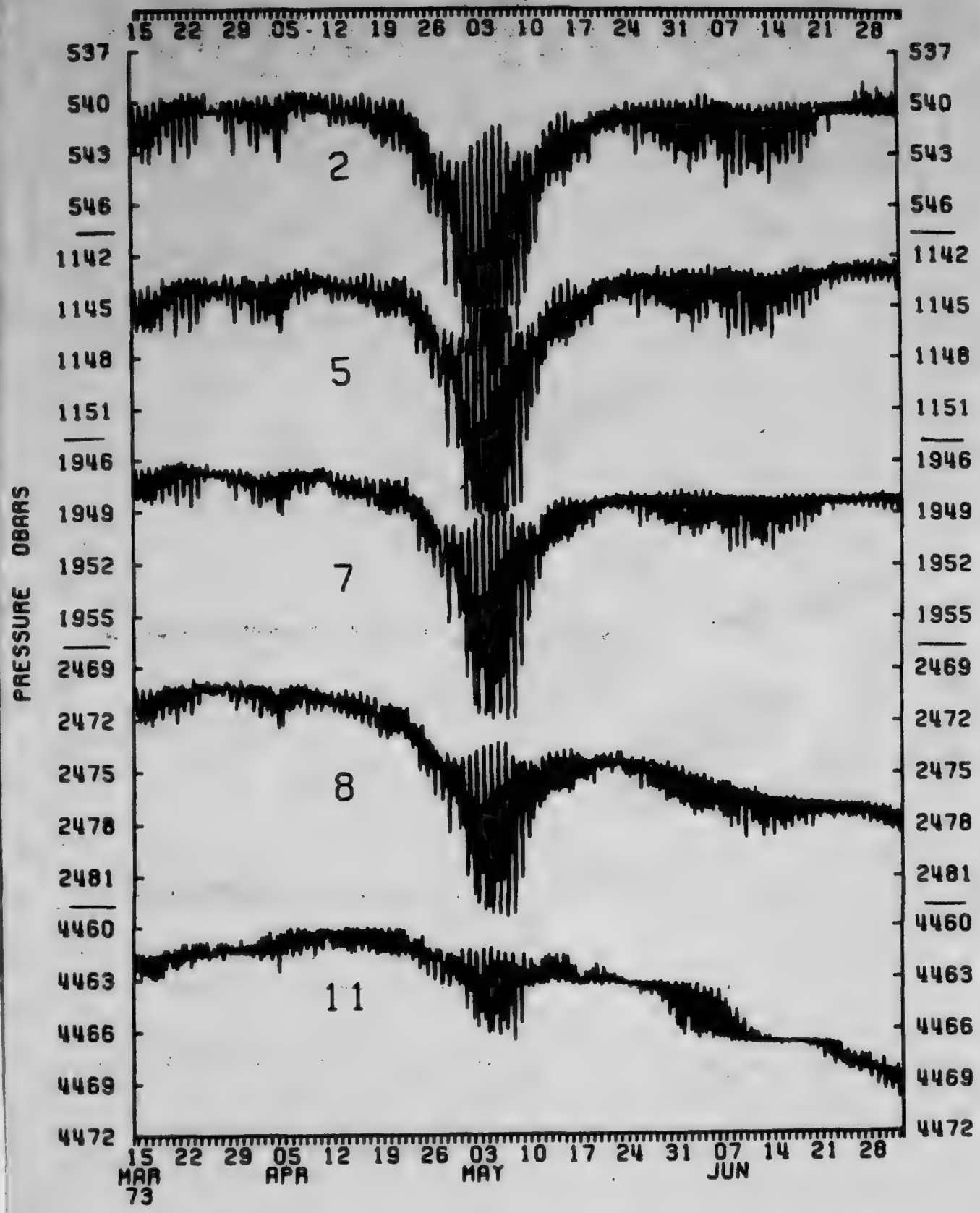
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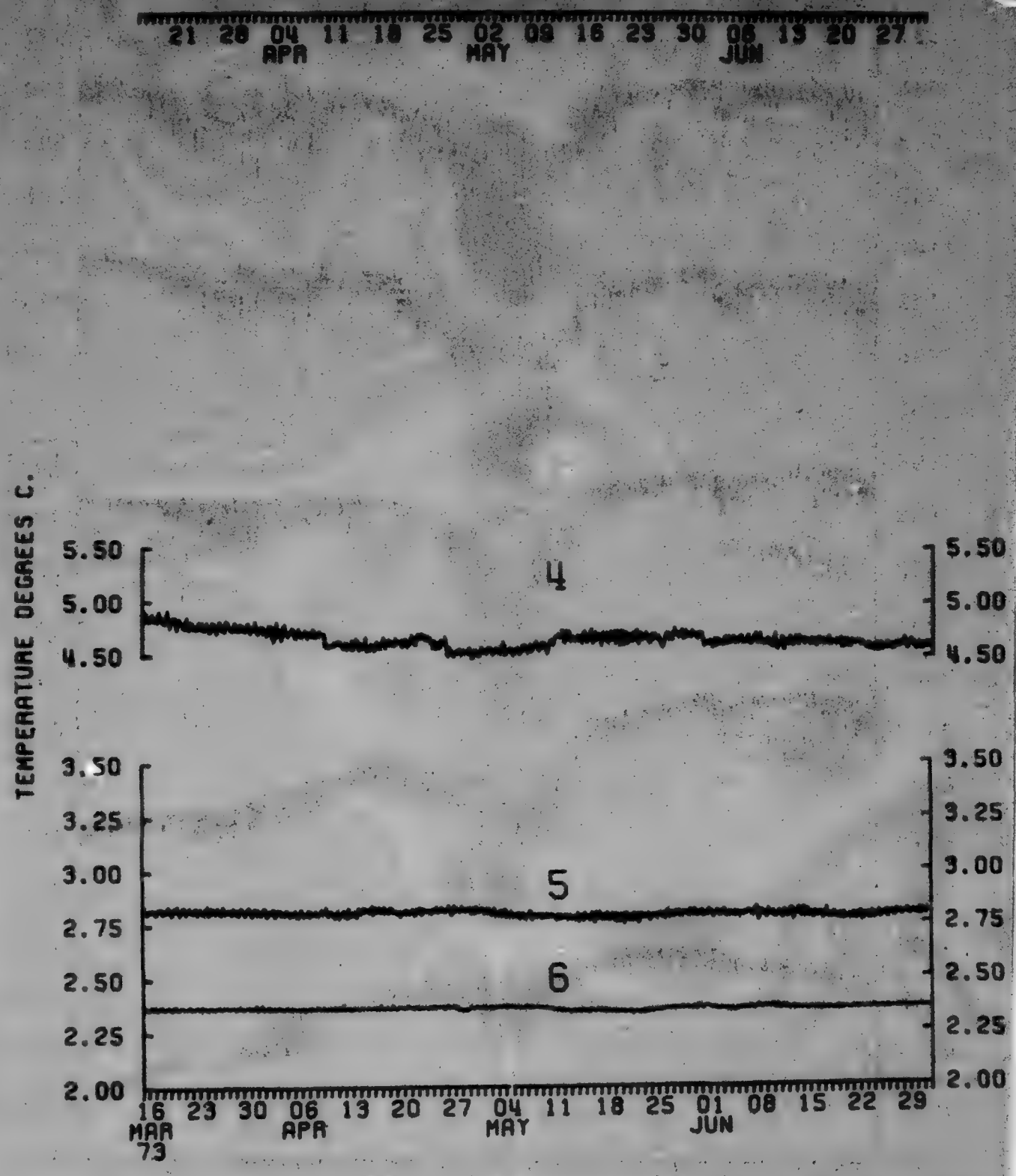
PRESSURE DBARS
MAR 73
APR
MAY
JUN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MAY
JUN
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3.00
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MAR
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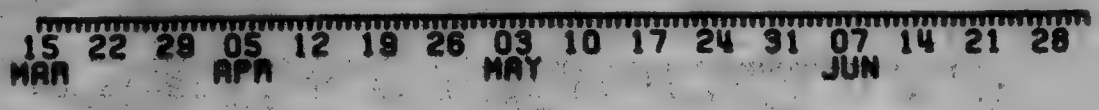
APR
MAY
JUN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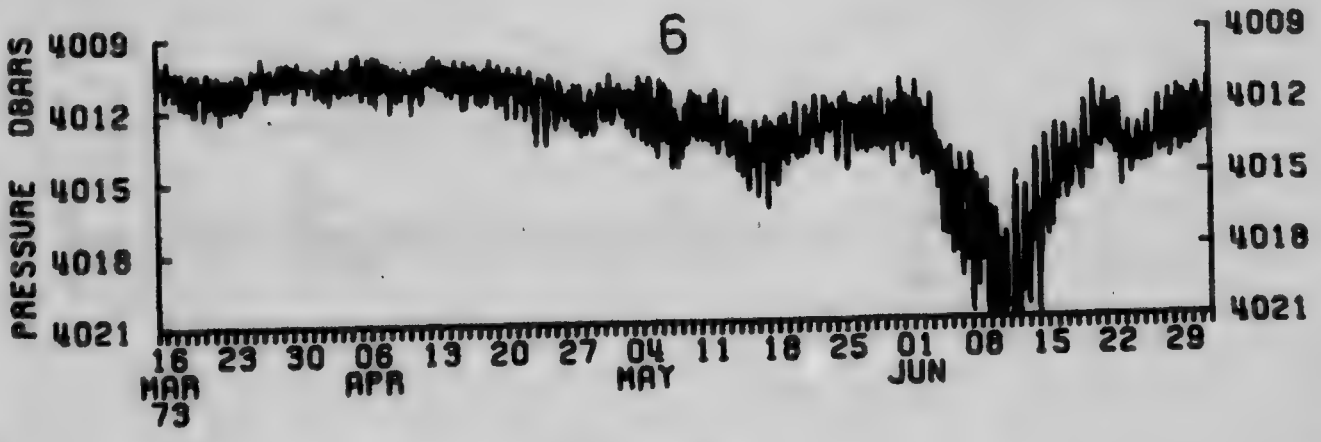
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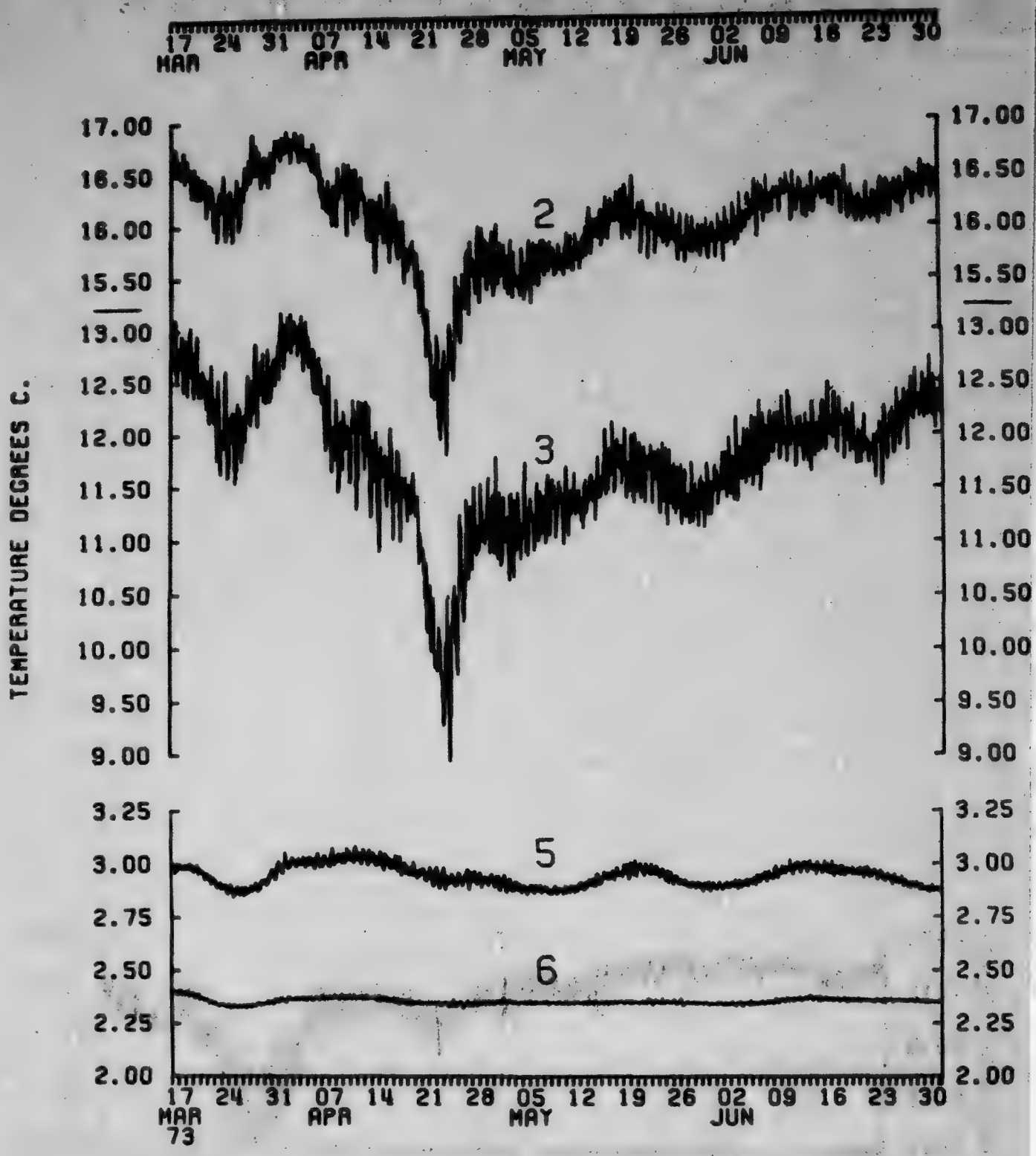
MAY
JUN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10.50
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3.00
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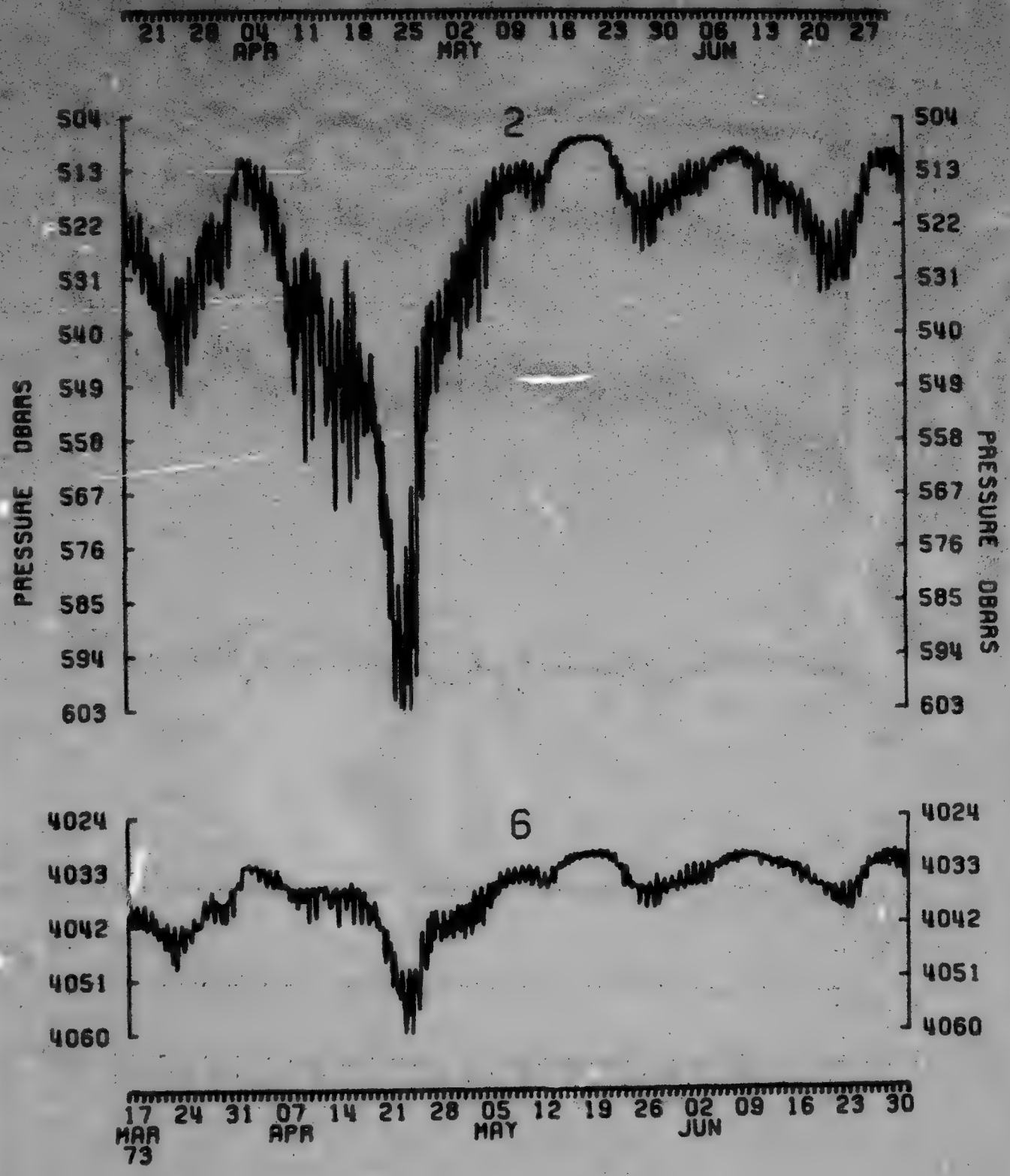
MAR
73
APR
MAY
JUN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MAY
JUN
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585
594
603
PRESSURE DBARS
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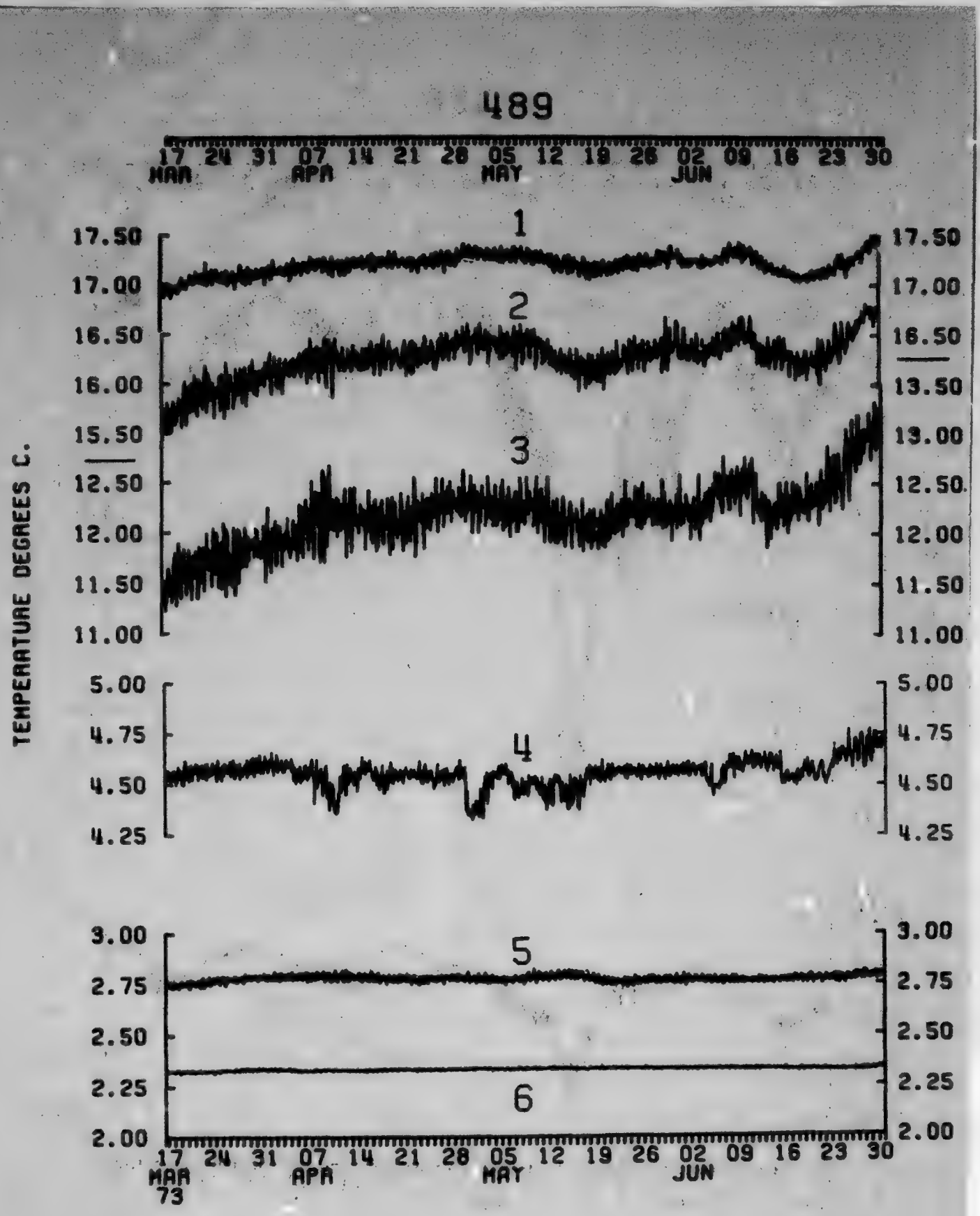
MAR
73
APR
MAY
JUN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JUN
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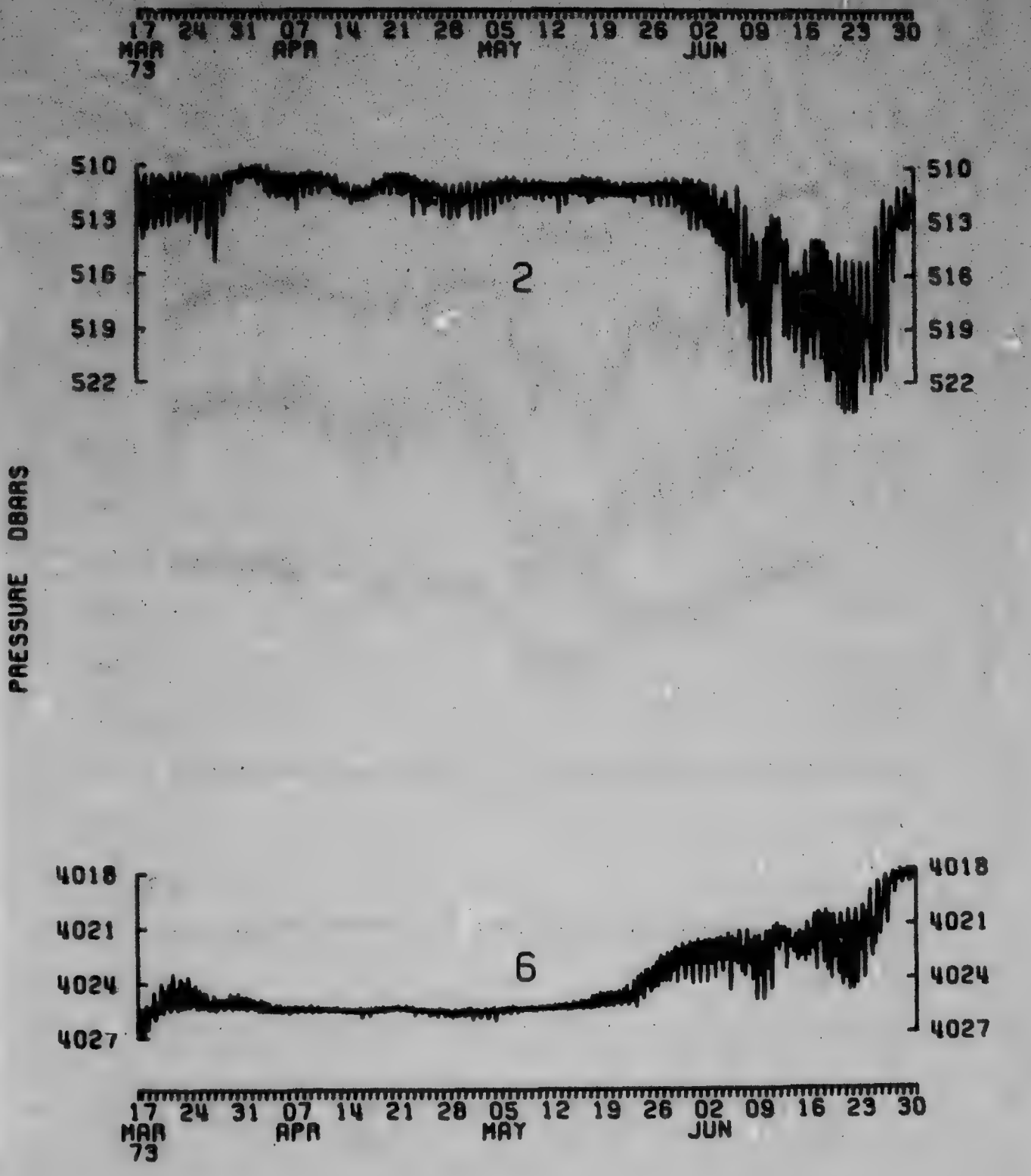
TEMPERATURE DEGREES C.
MAR
73


17 24 31 07 14 21 28 05 12 19 26 02 09 16 23 30
MAR 73
APR
MAY
JUN
510
513
516
519
522
2
PRESSURE DBARS
4018
4021
4024
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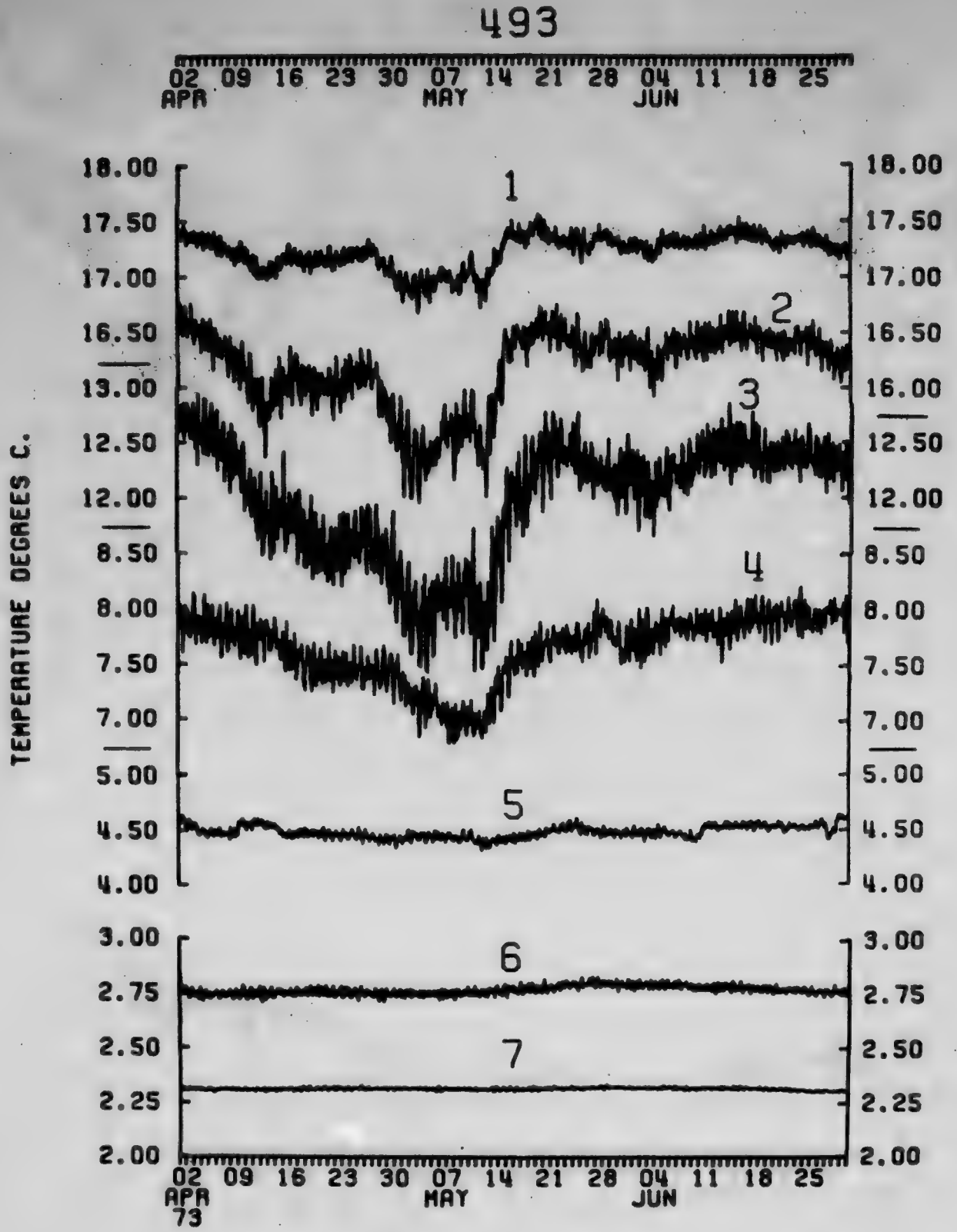
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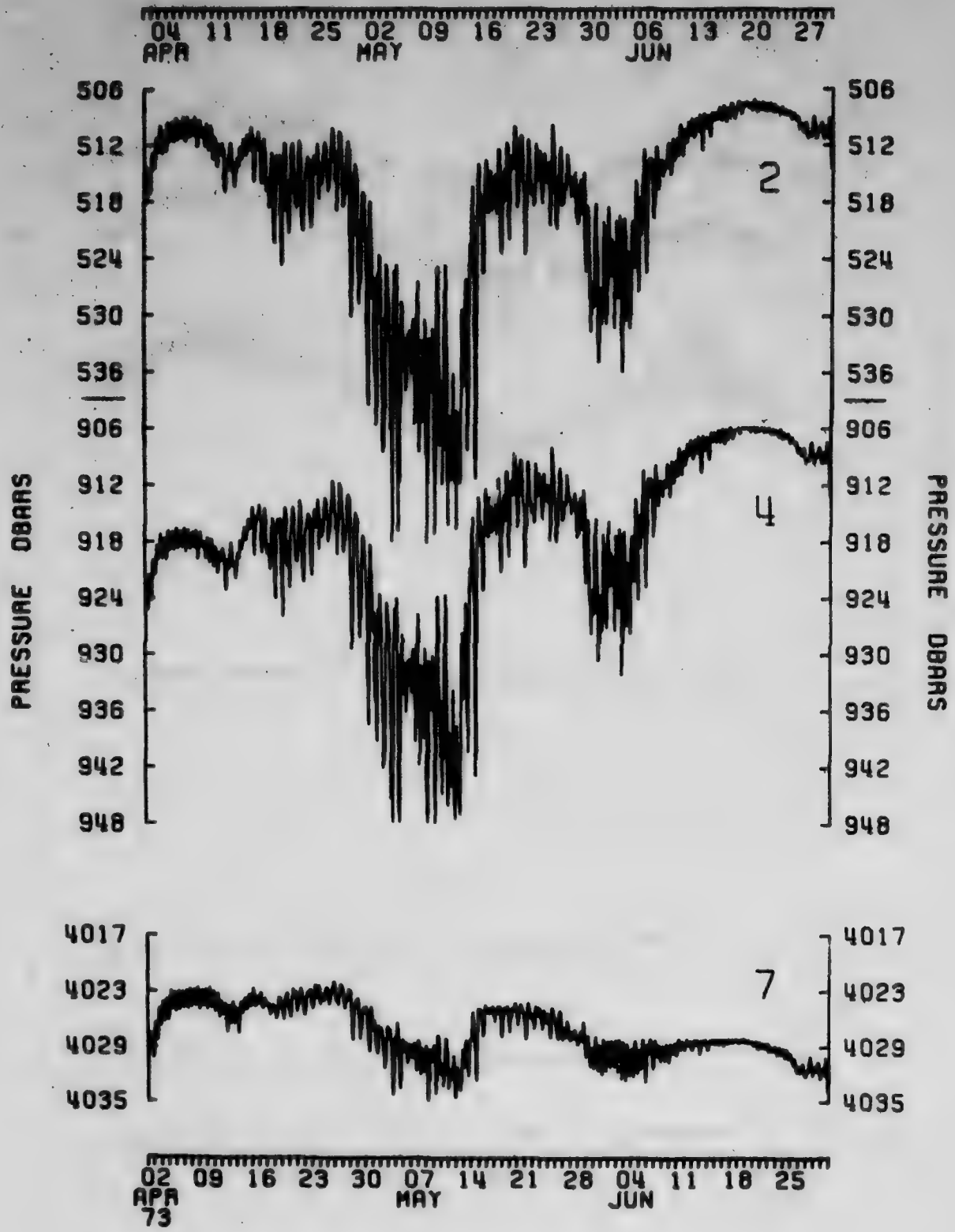
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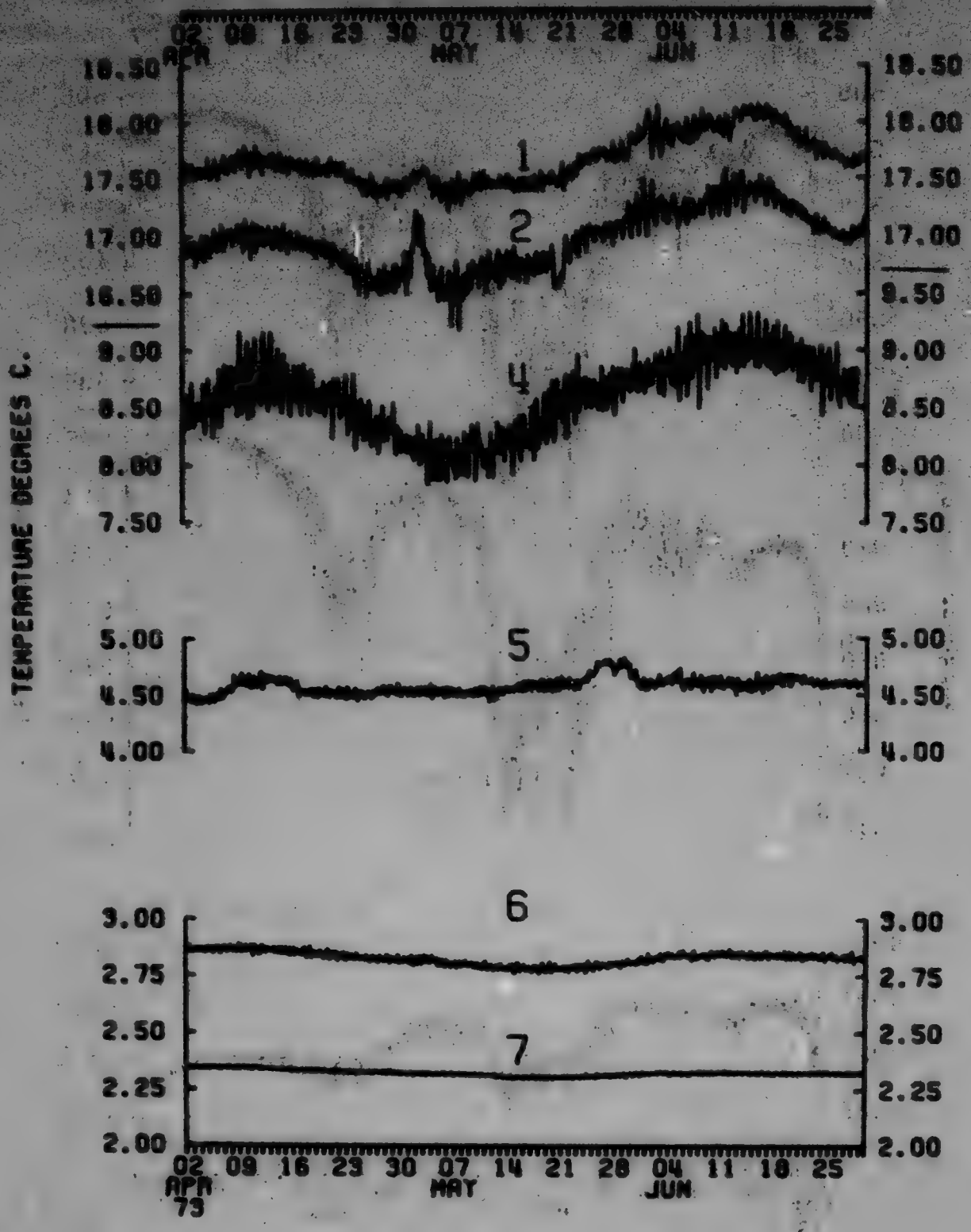
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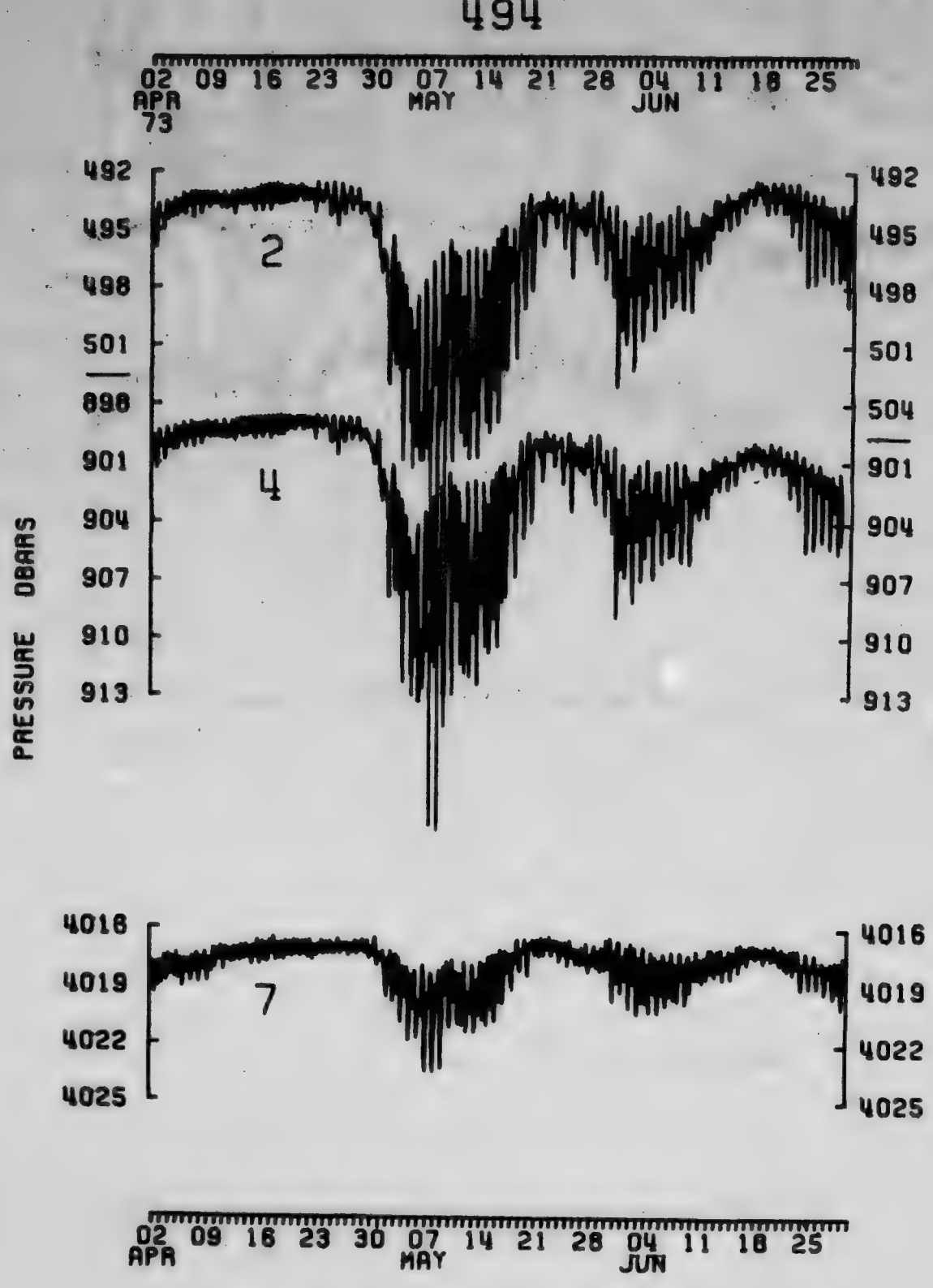
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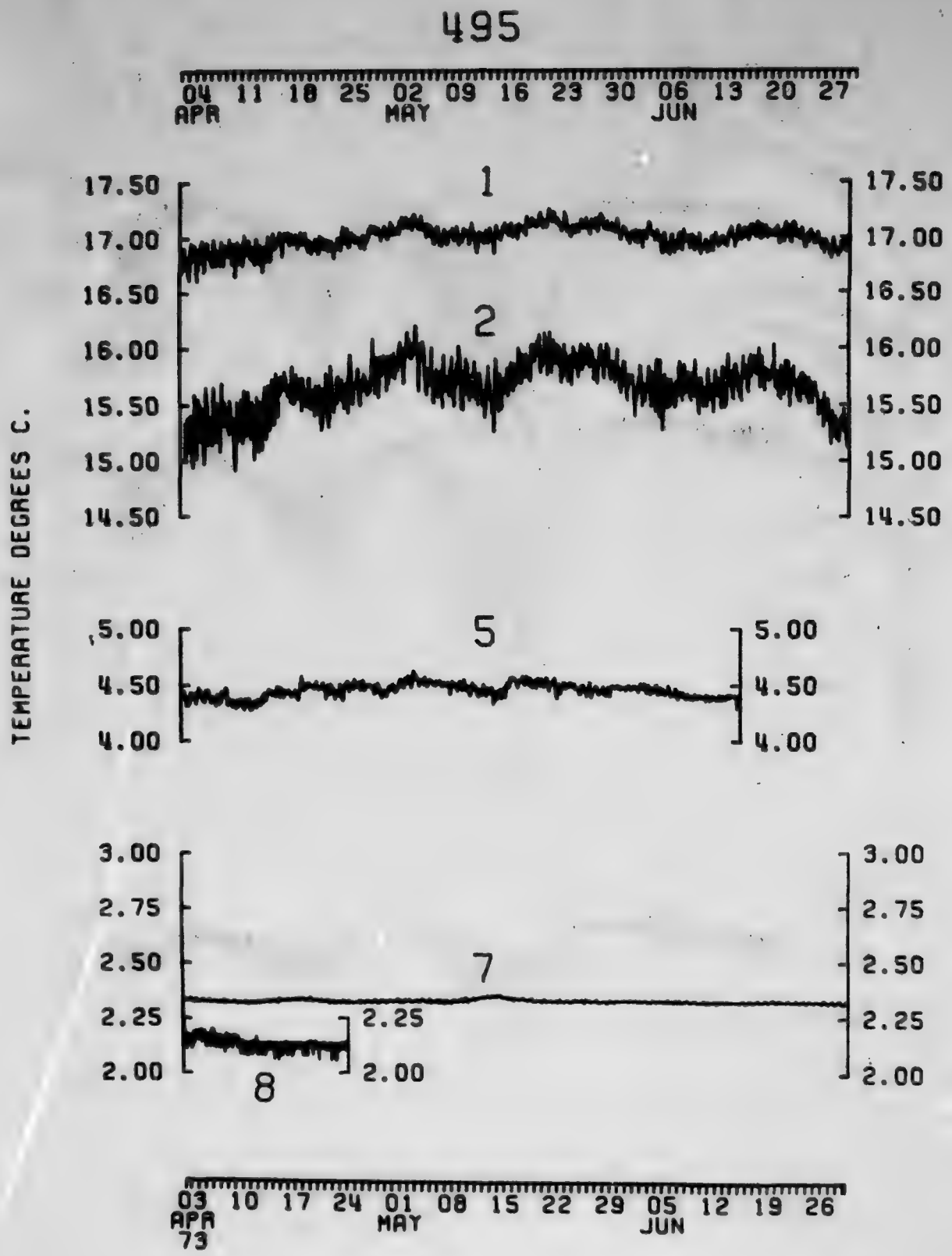
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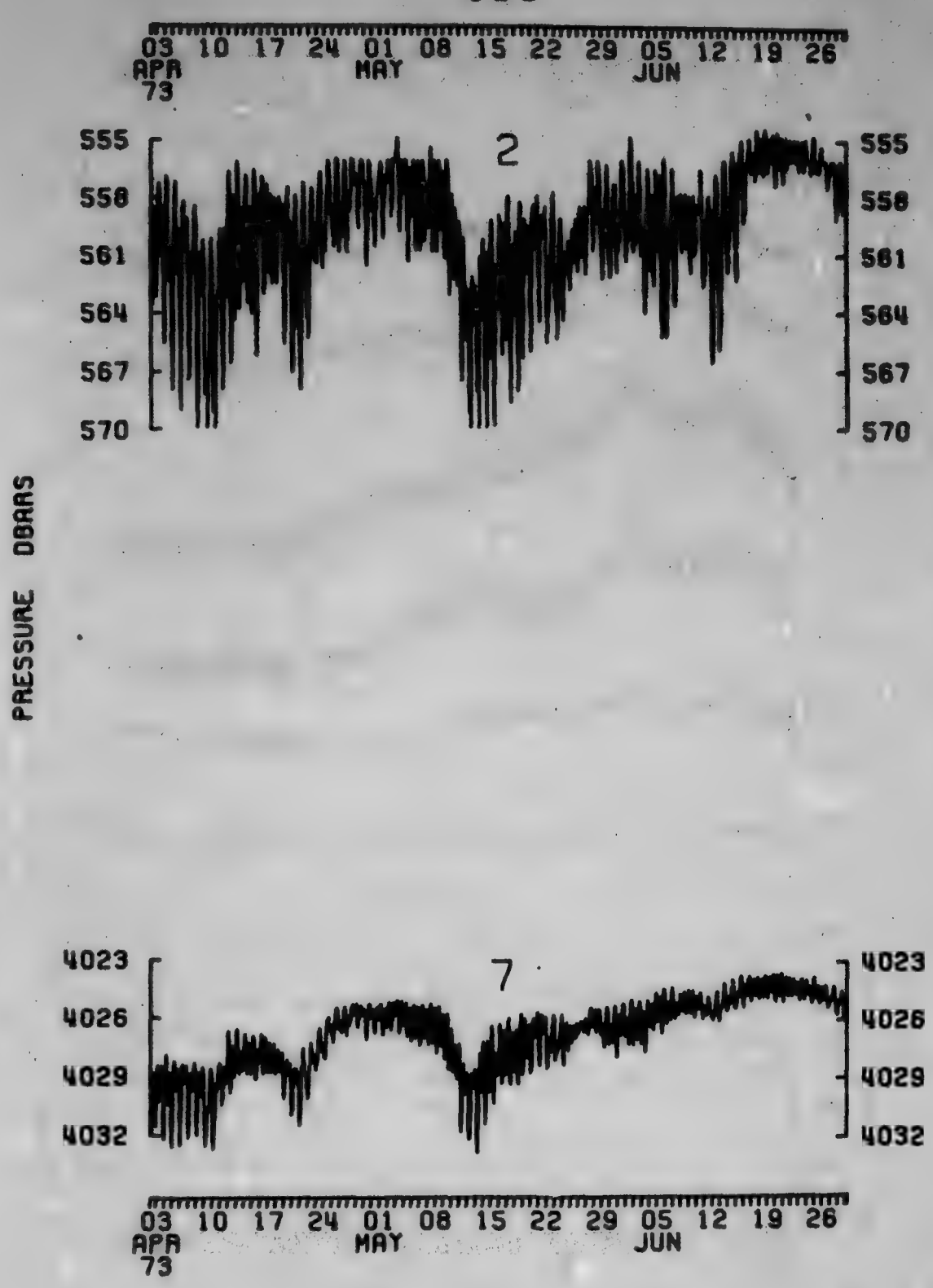
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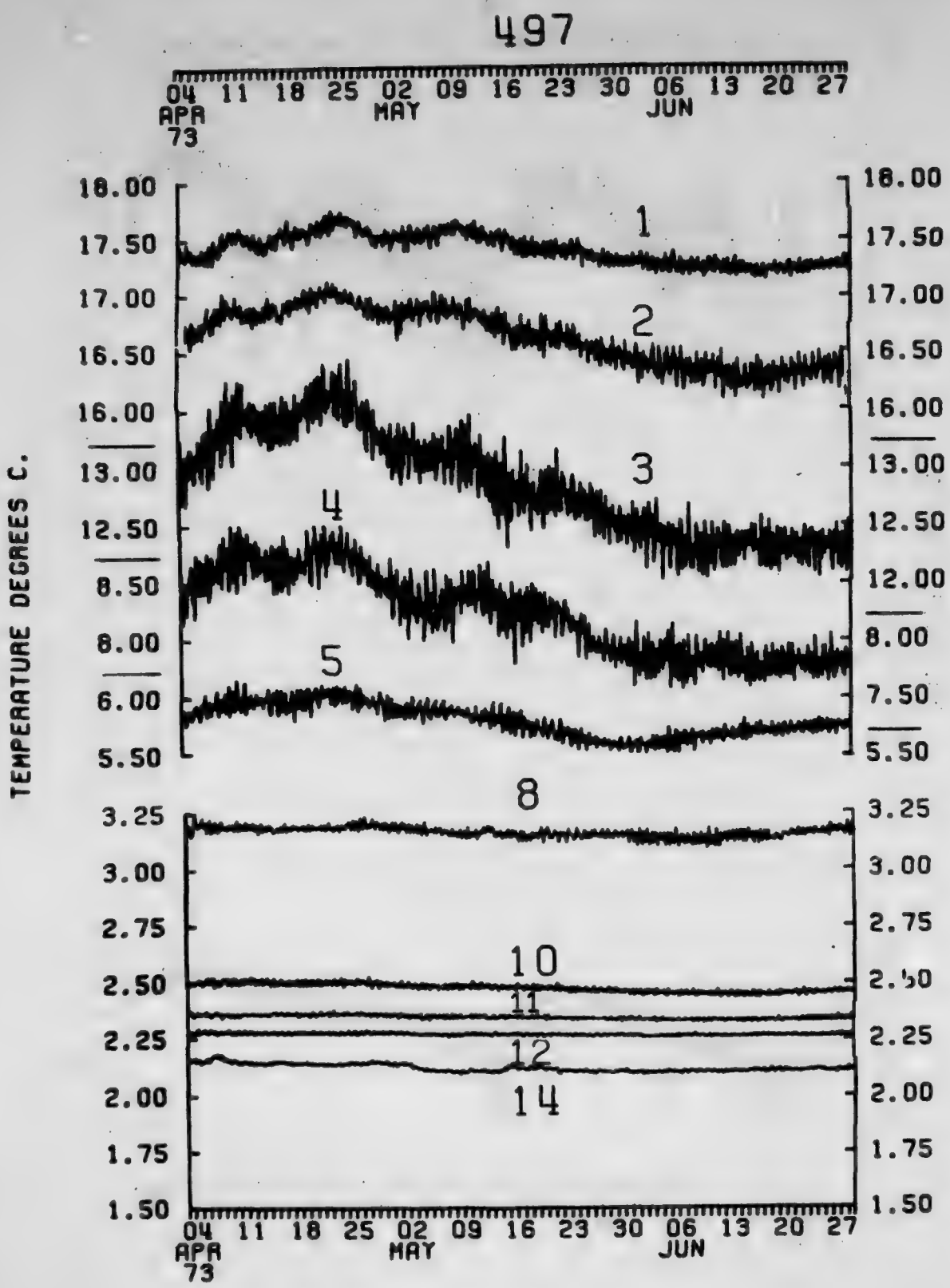
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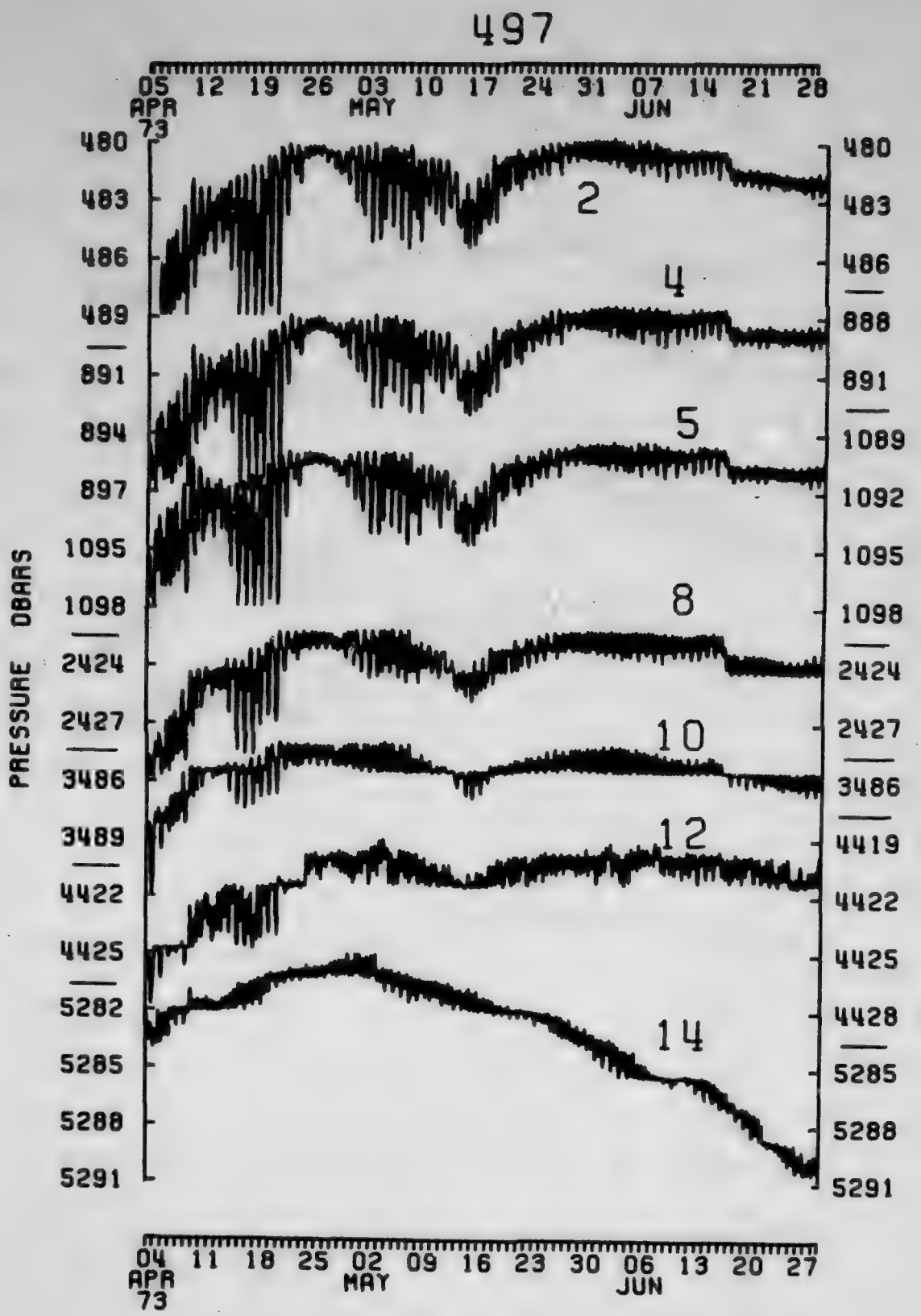
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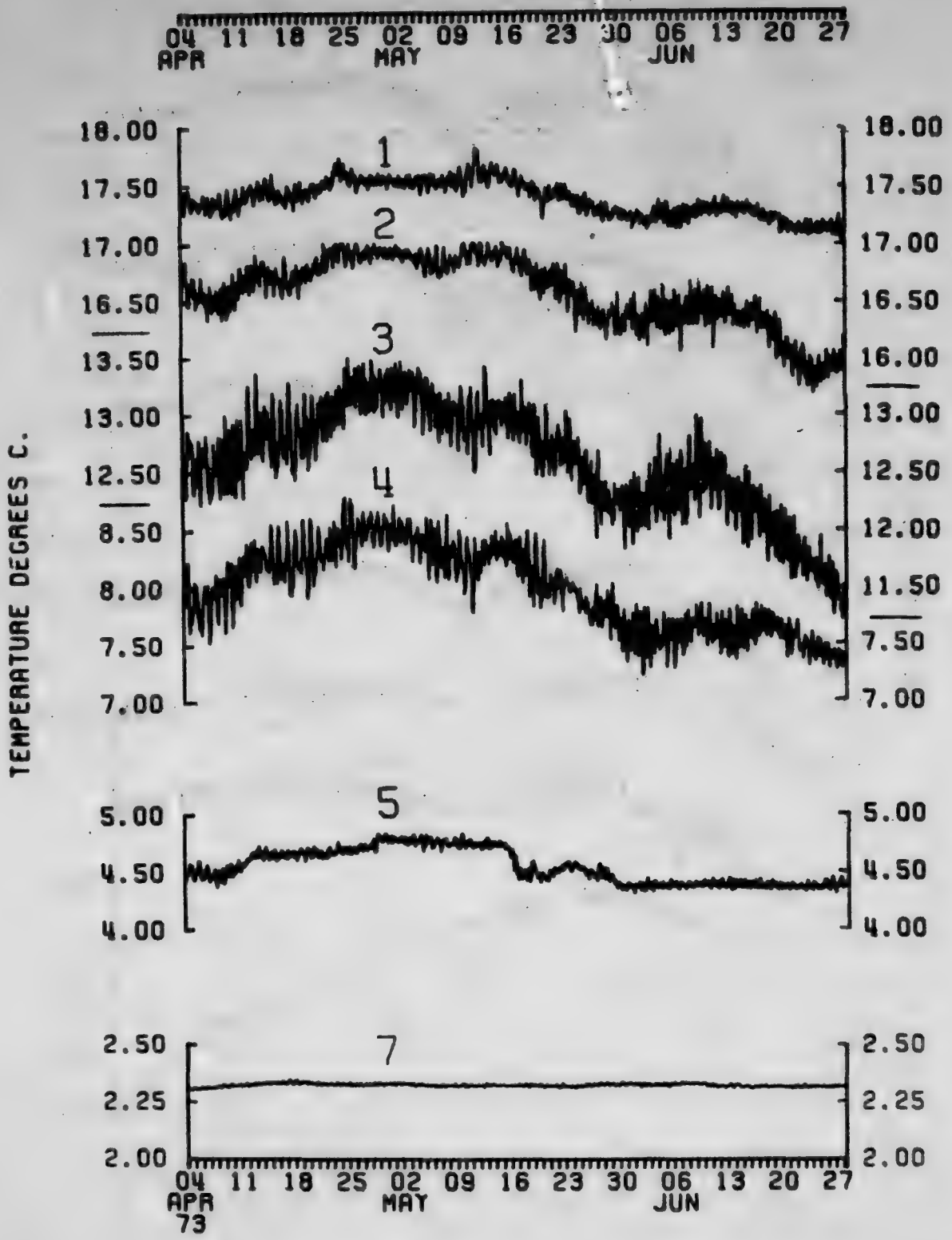
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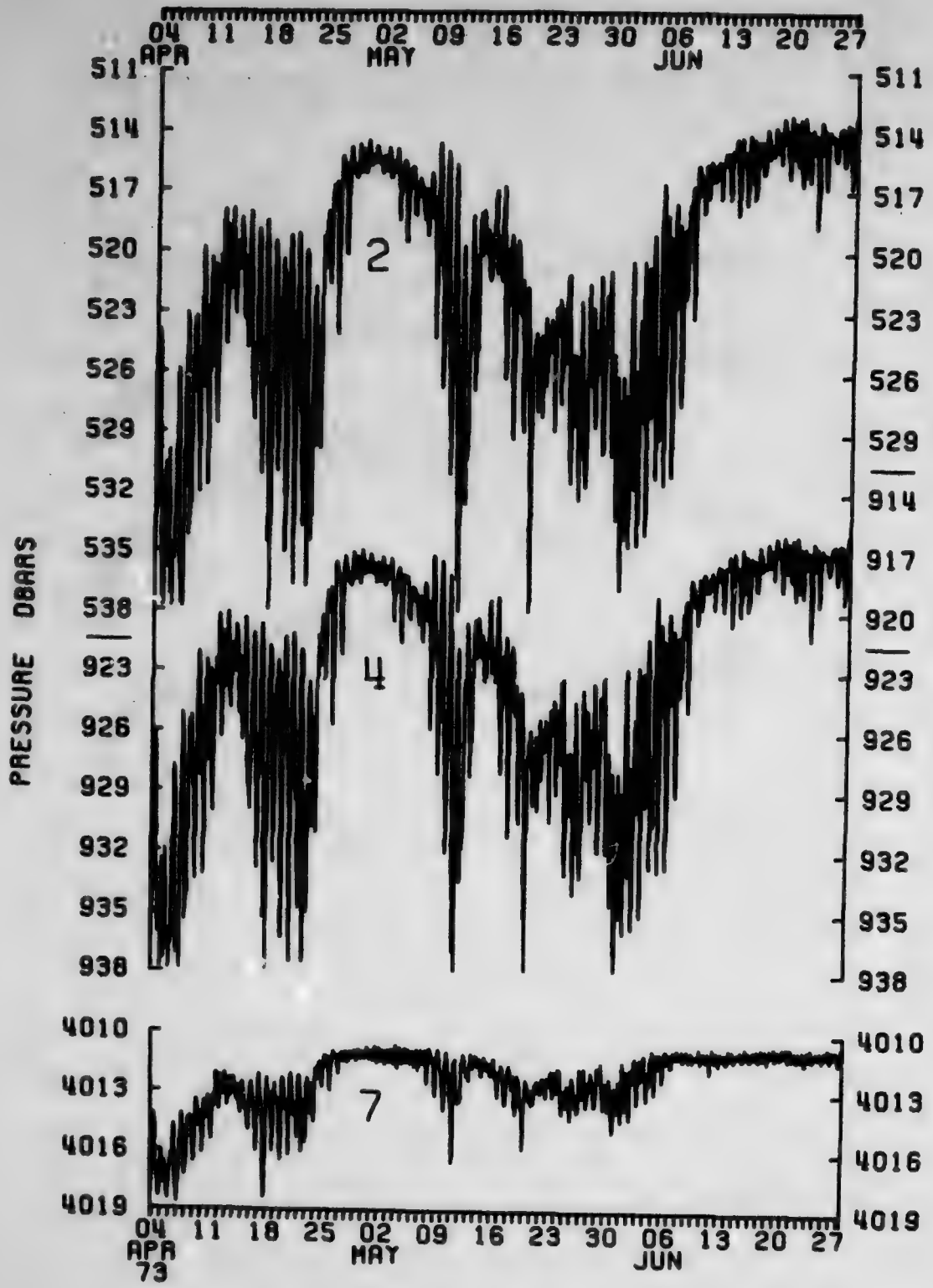
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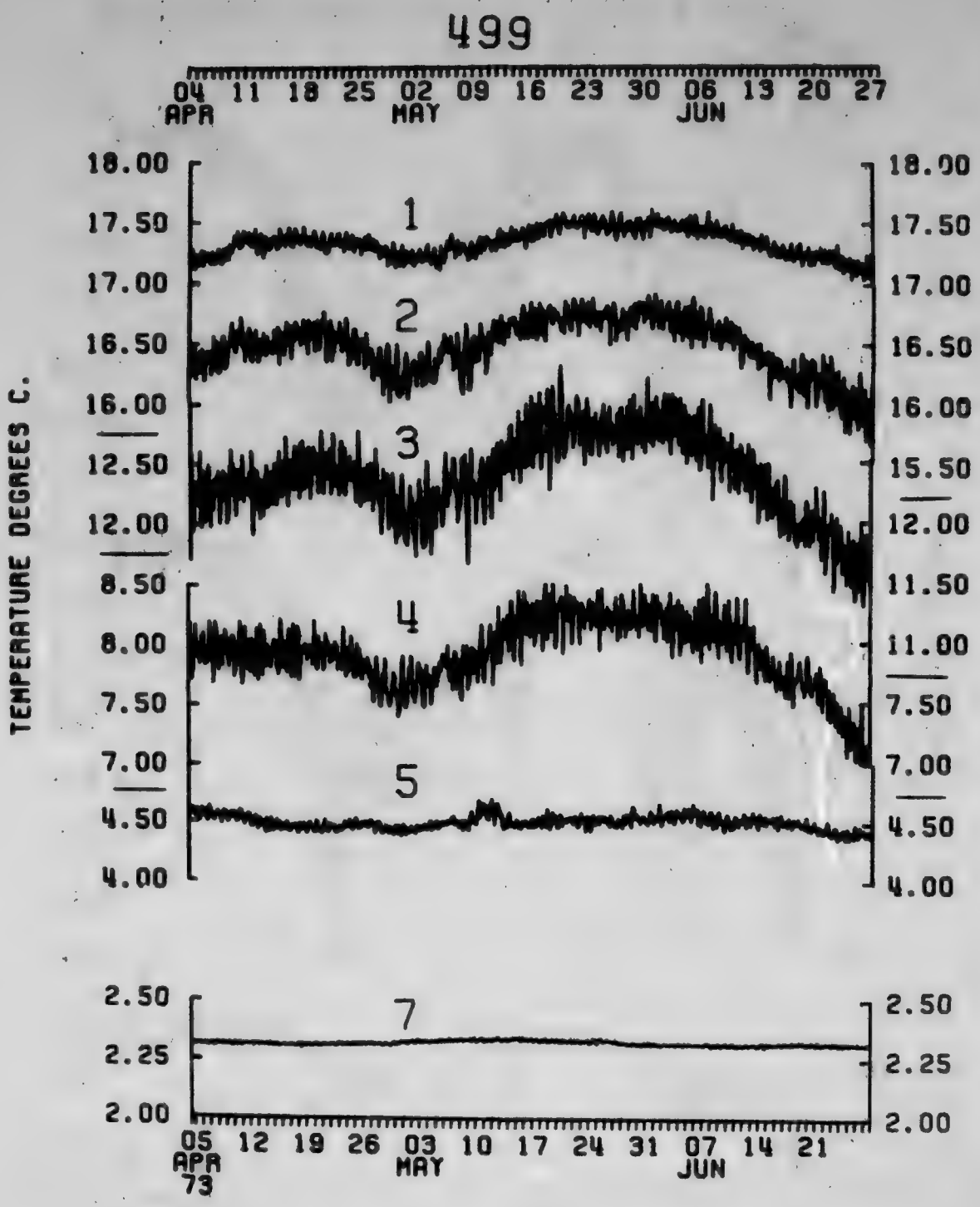
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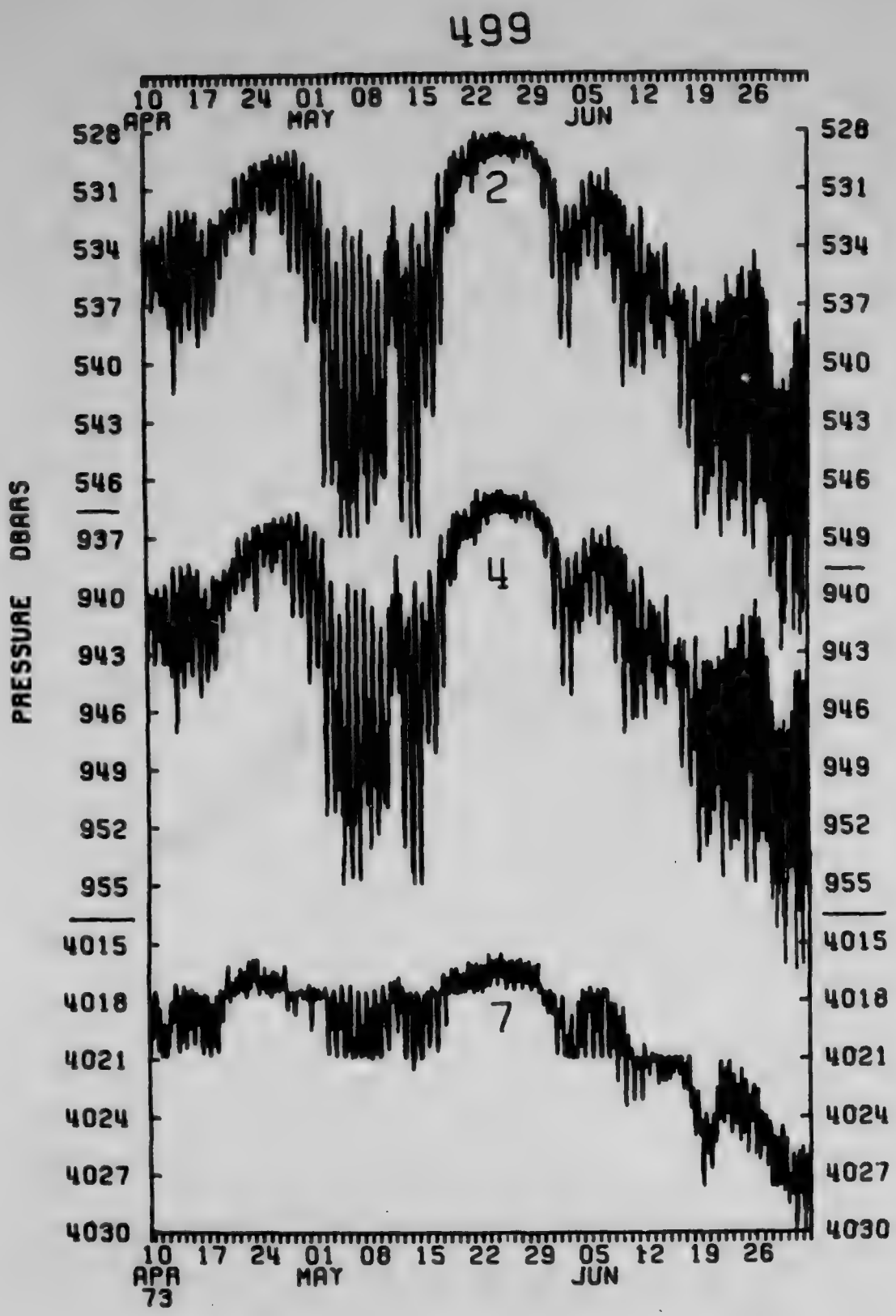
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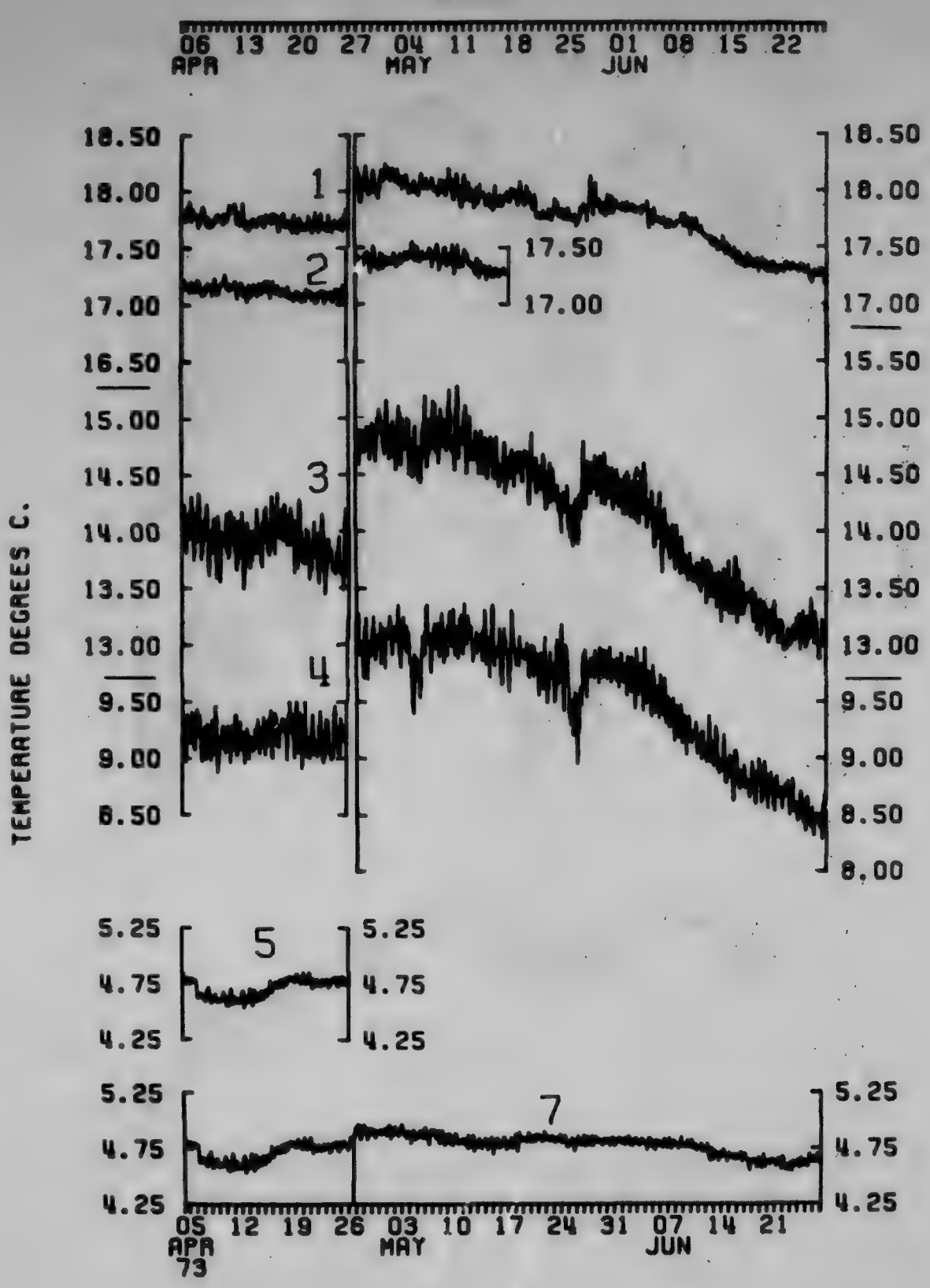
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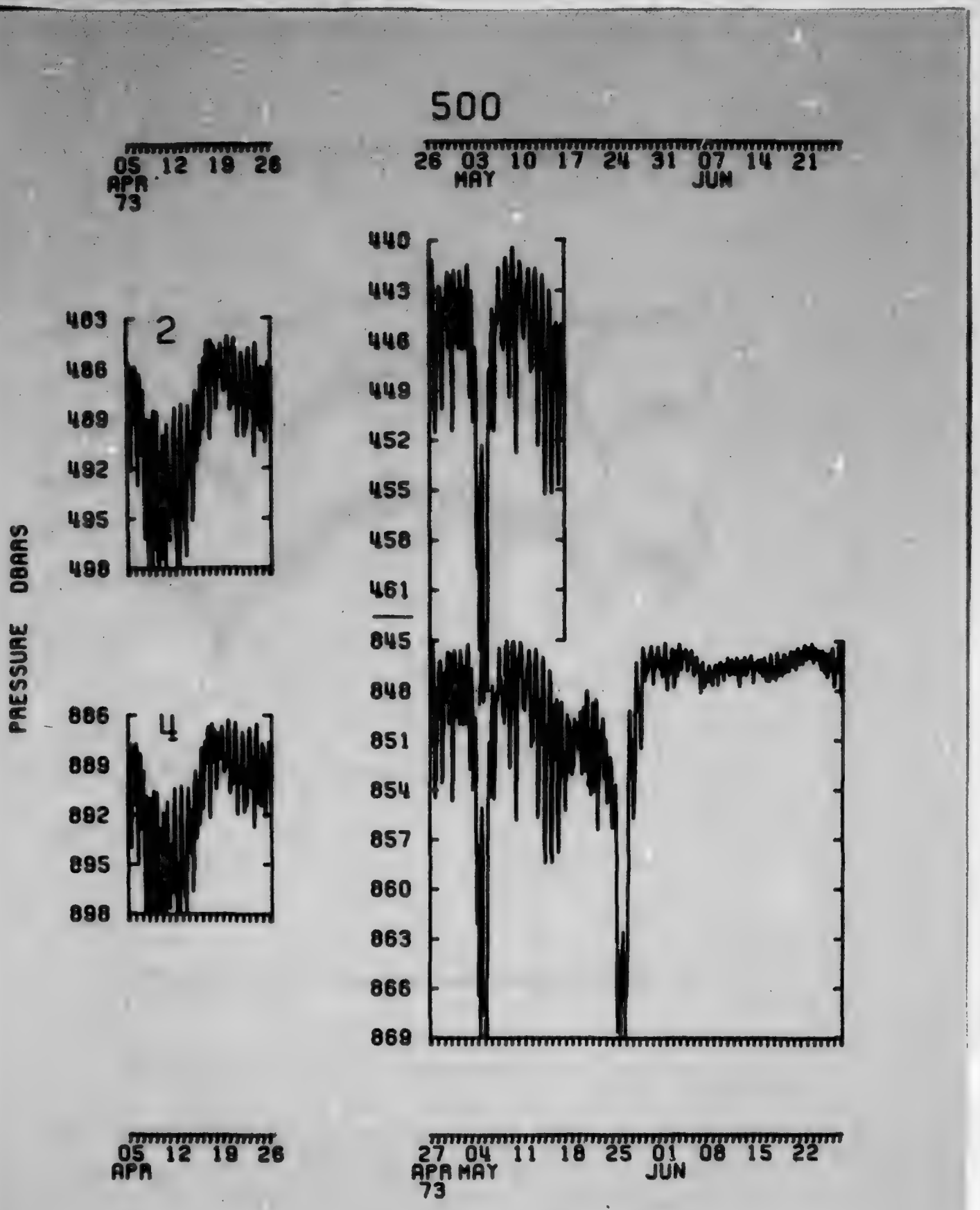
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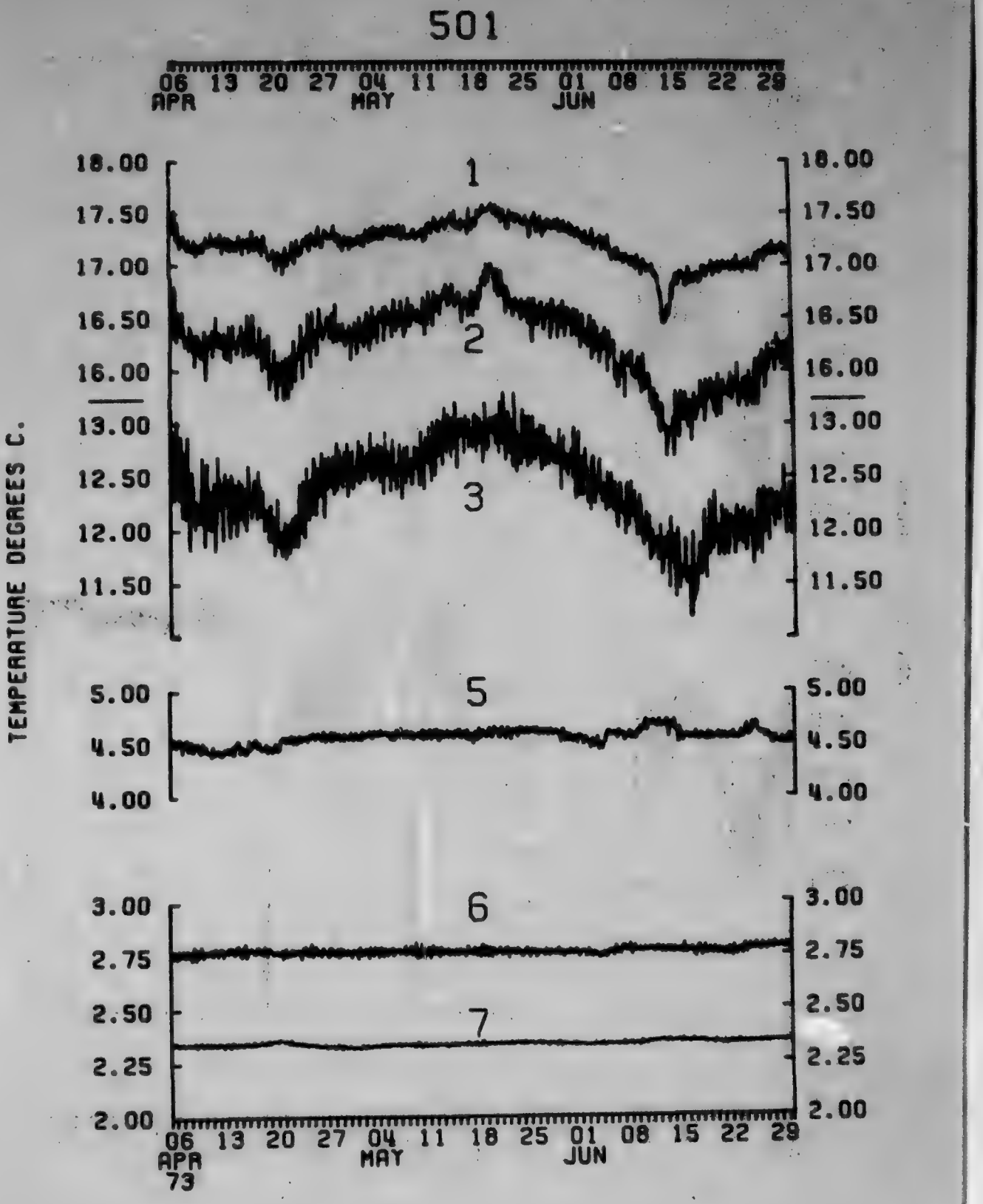
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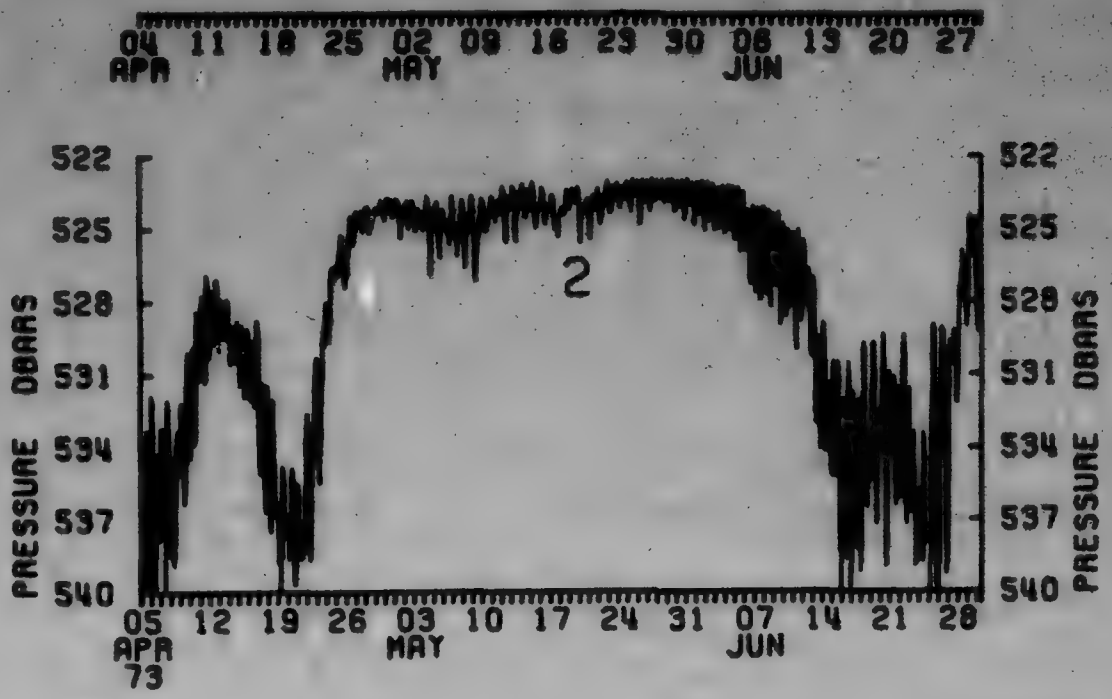
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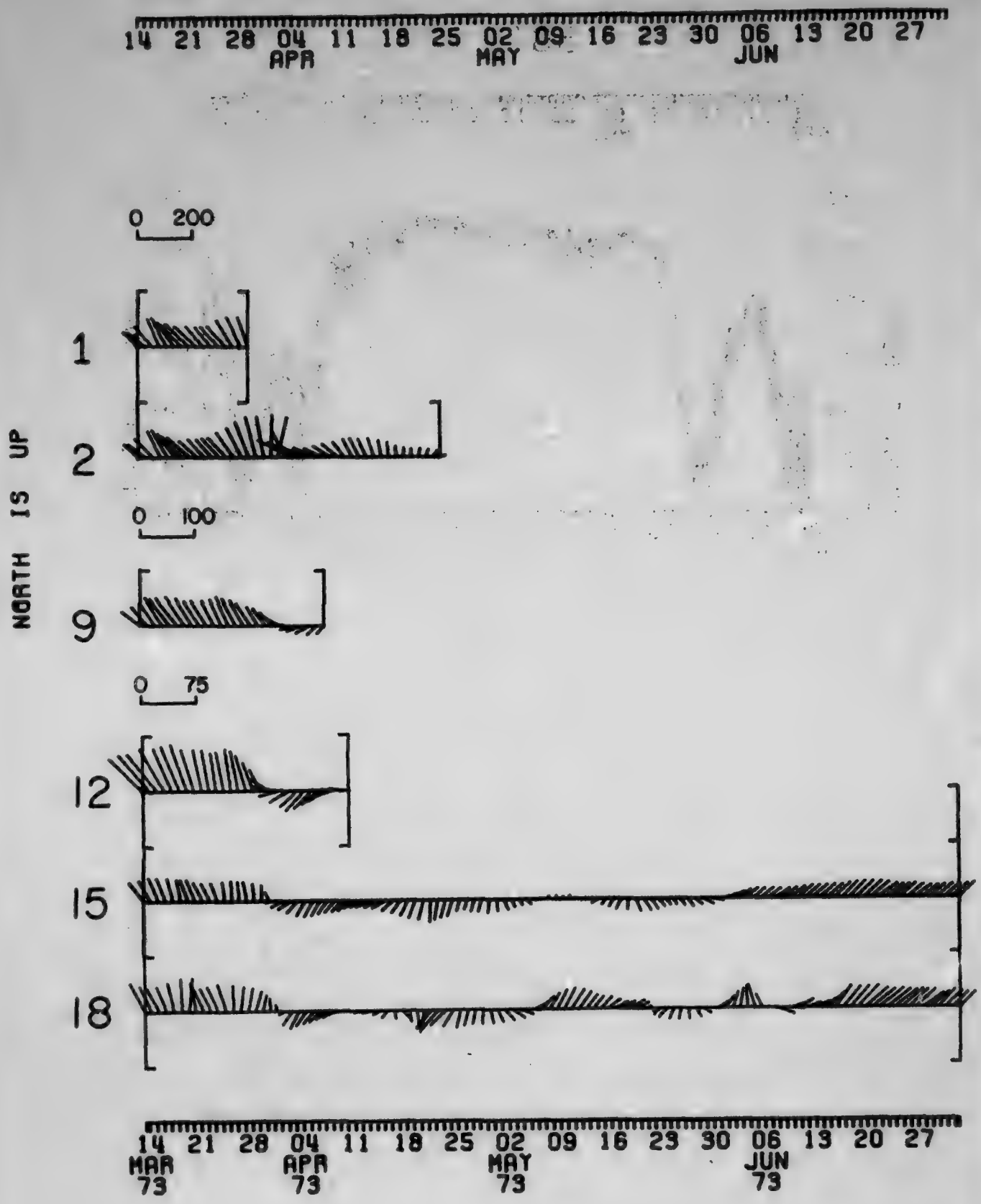
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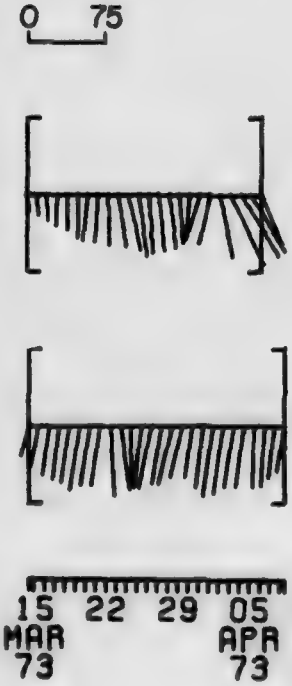

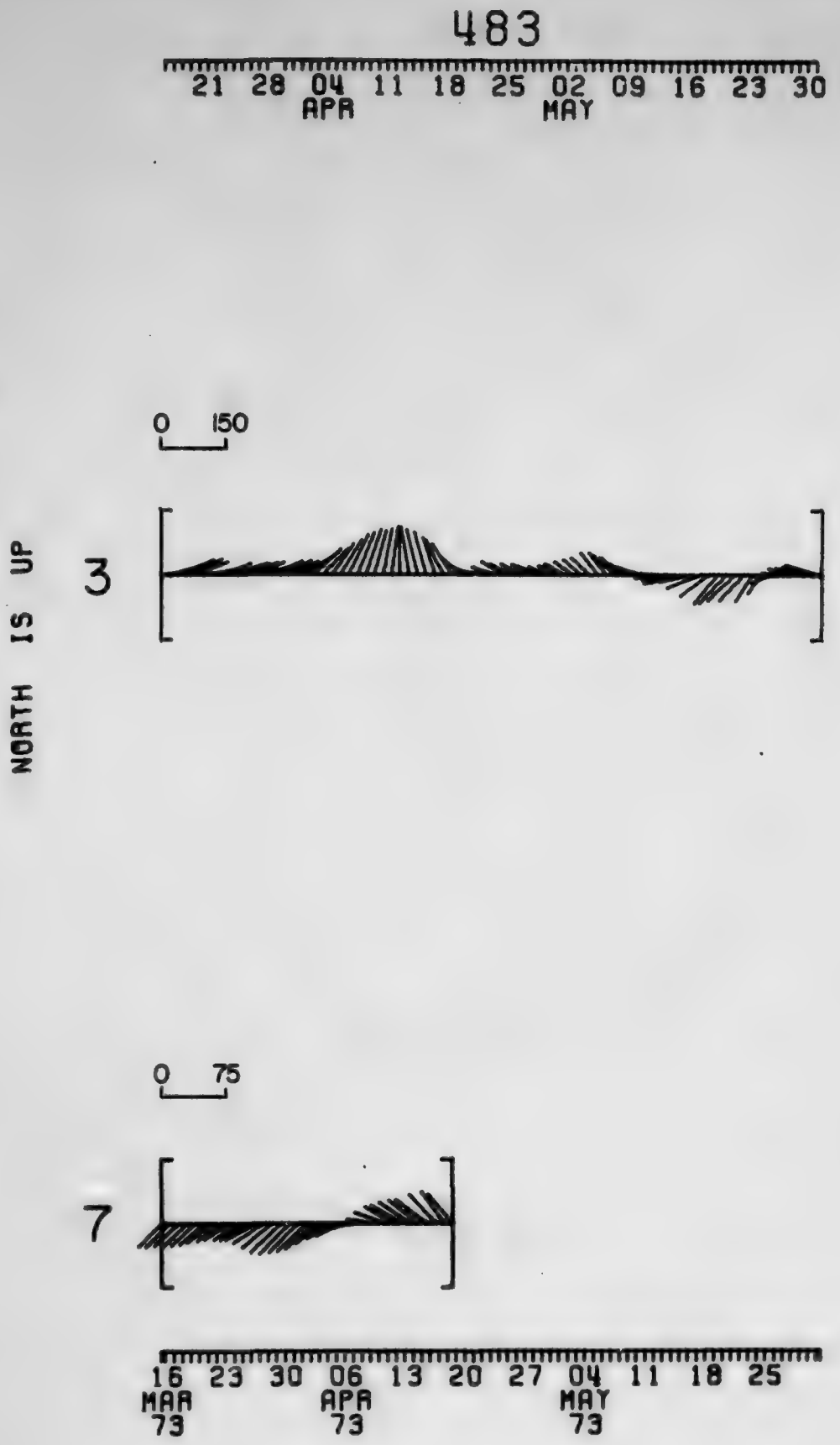
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AD-A034 671 WOODS HOLE OCEANOGRAPHIC INSTITUTION MASS F/G 8/3
A COMPILATION OF MOORED CURRENT DATA AND ASSOCIATED OCEANOGRAPH--ETC(U)
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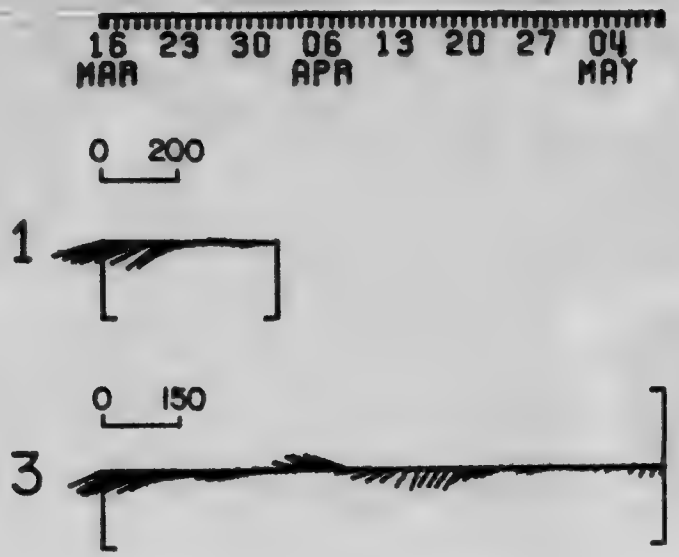
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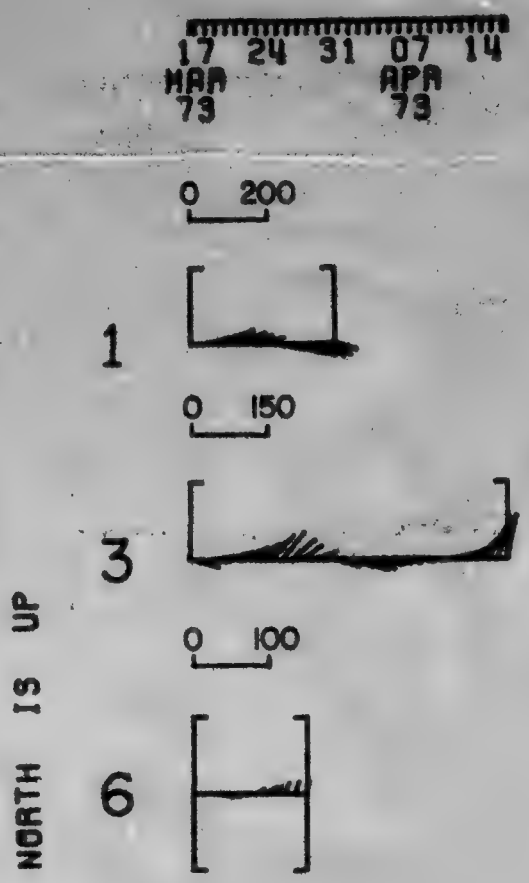
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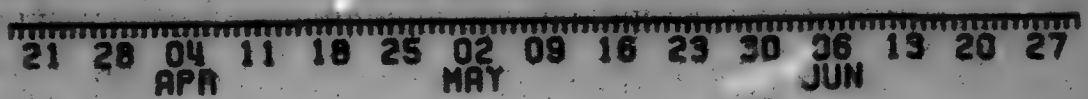
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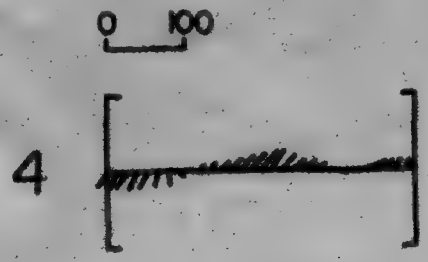
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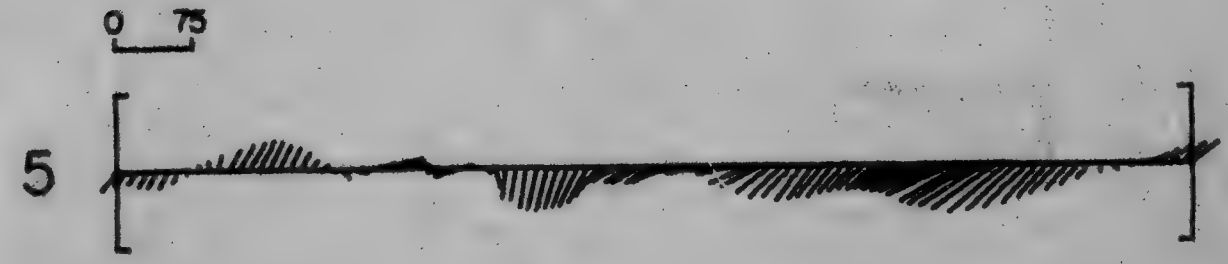
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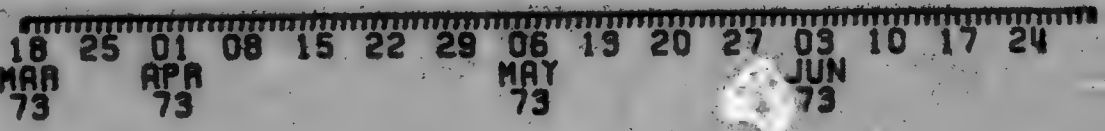
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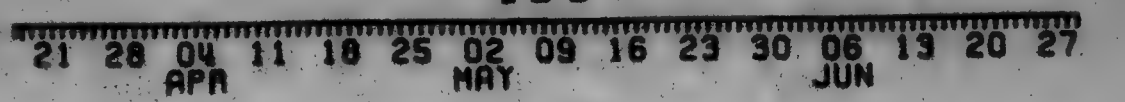
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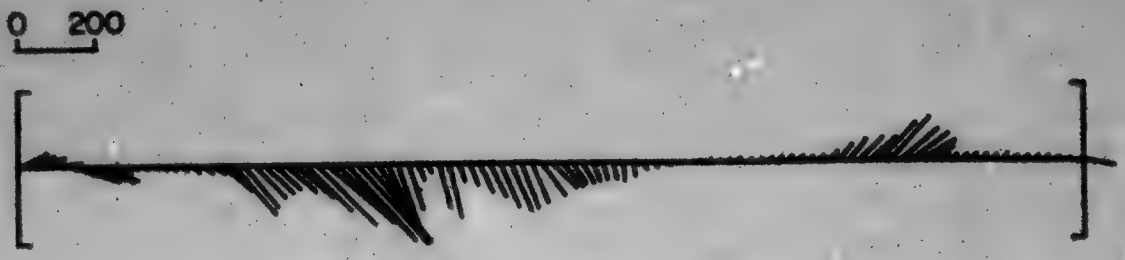
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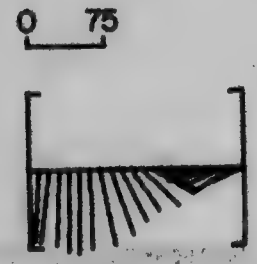
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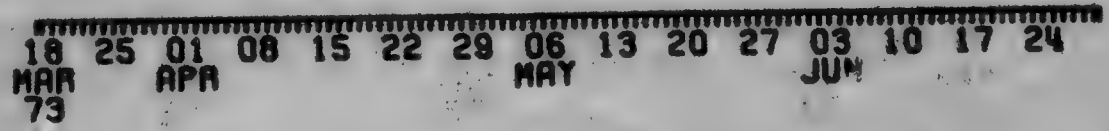
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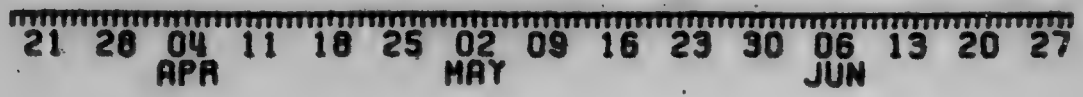
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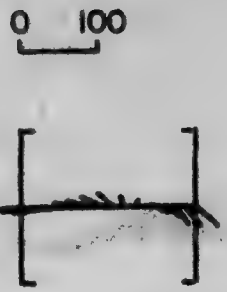
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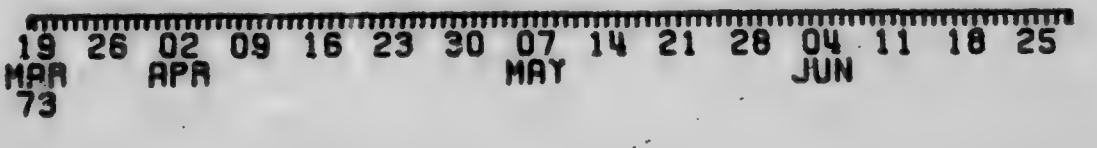
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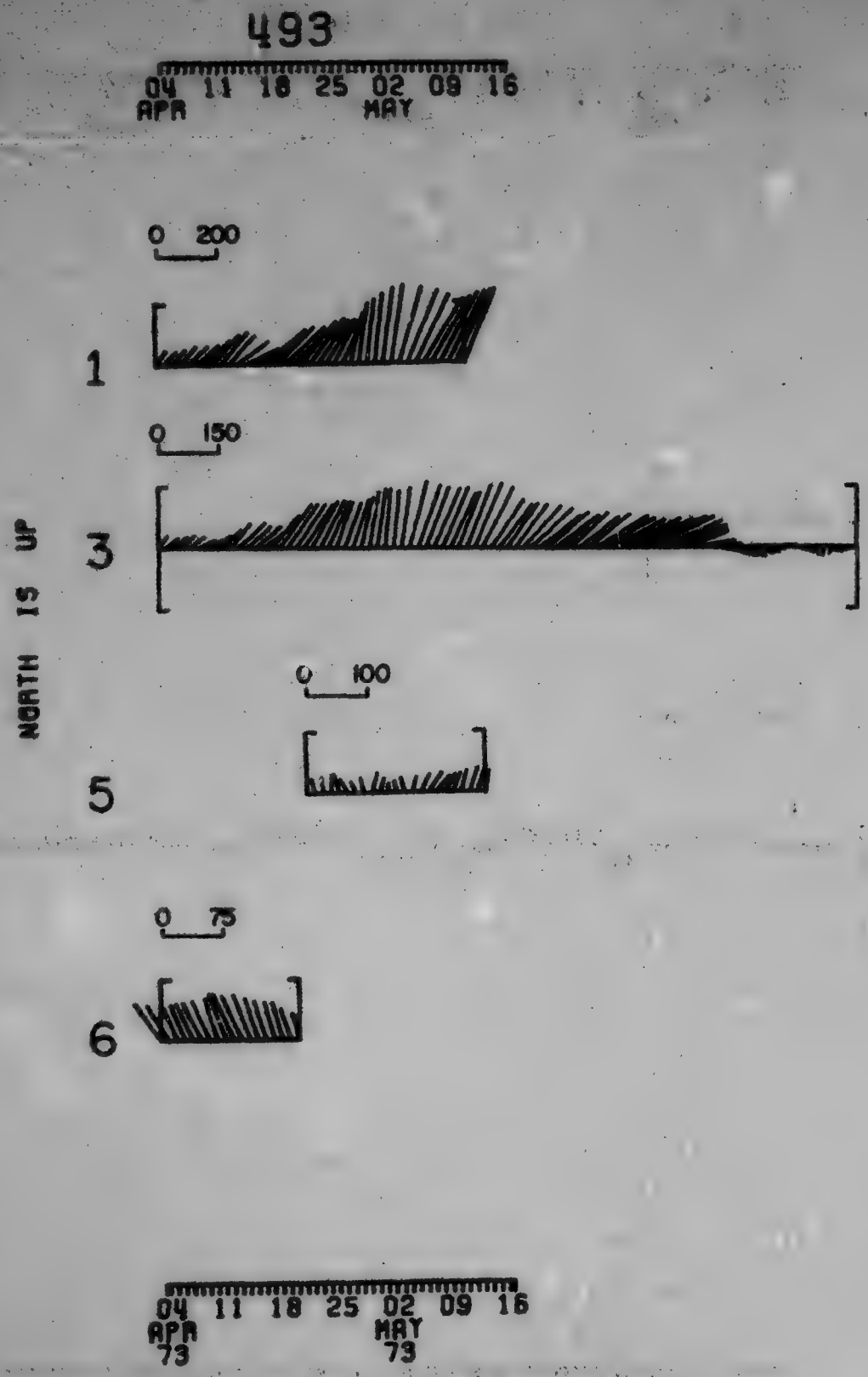
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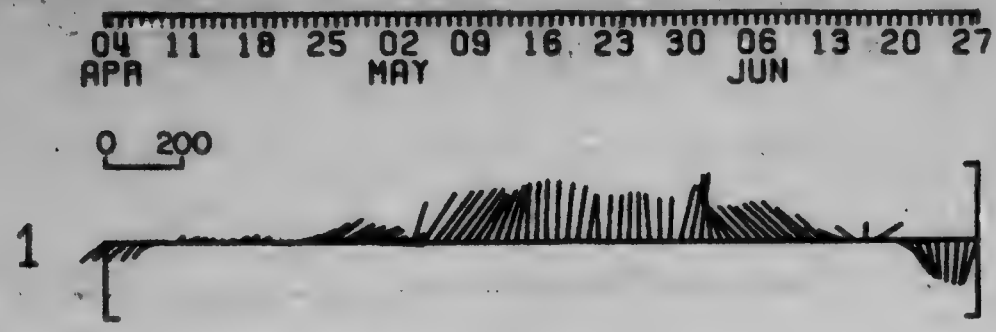

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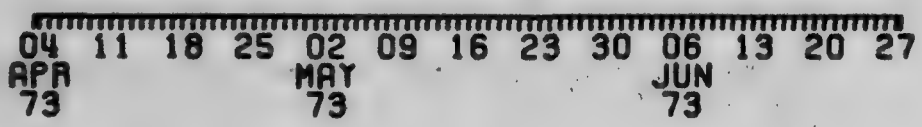

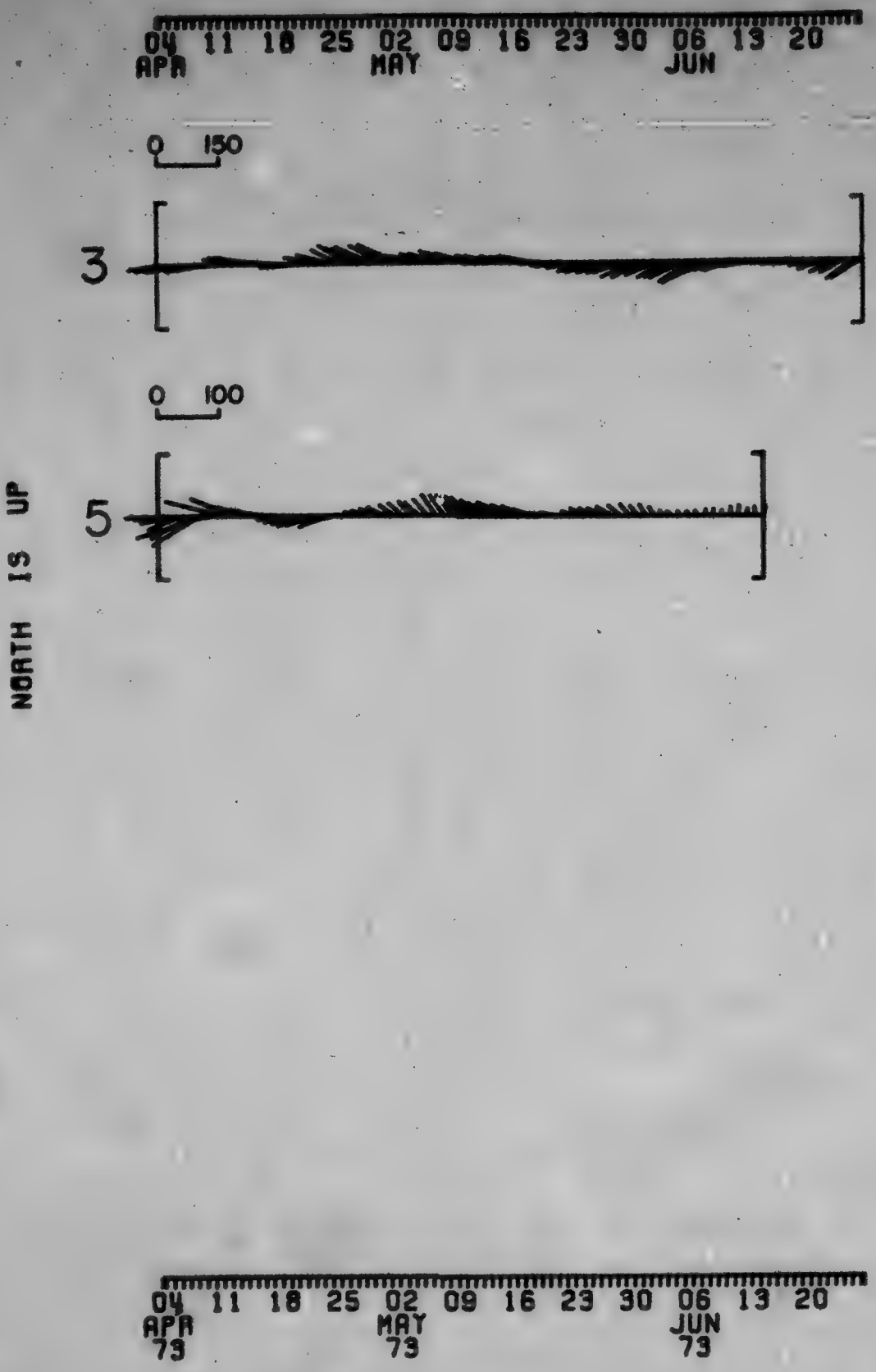
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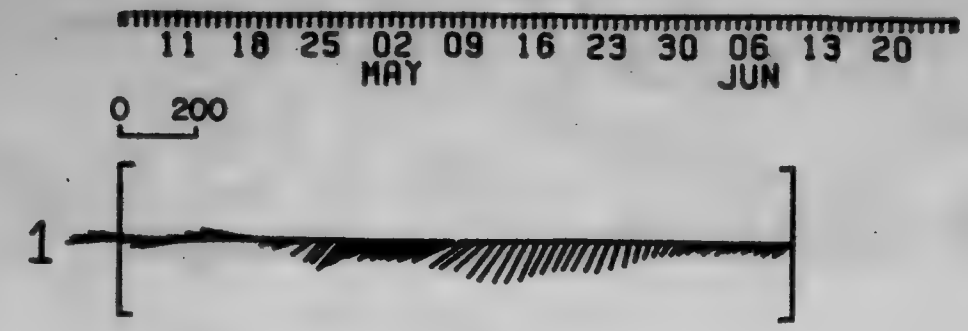
APR 73
MAY 73
JUN 73

497



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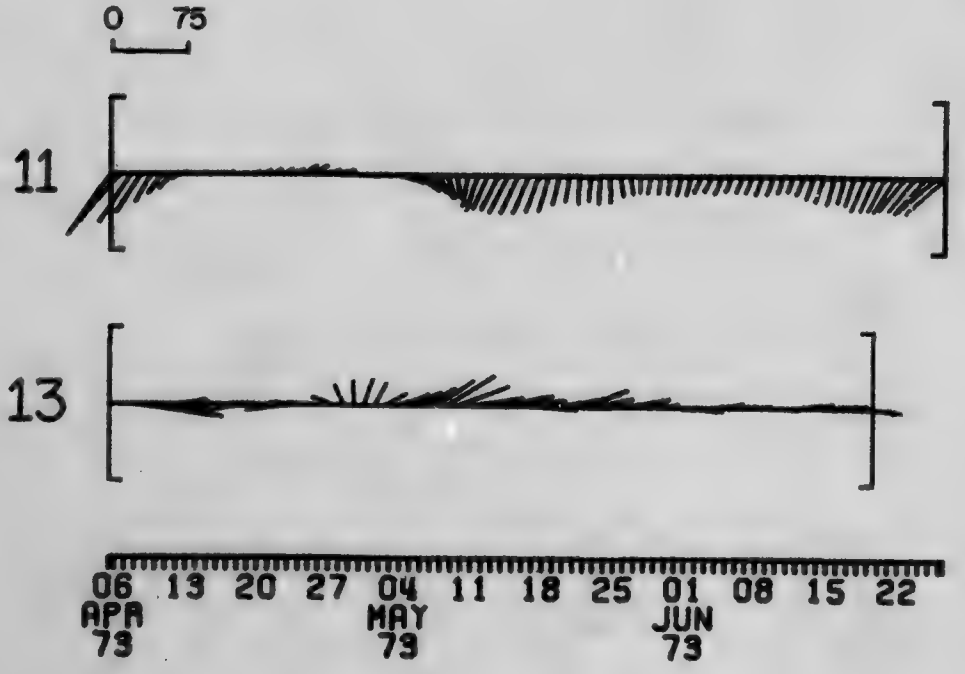

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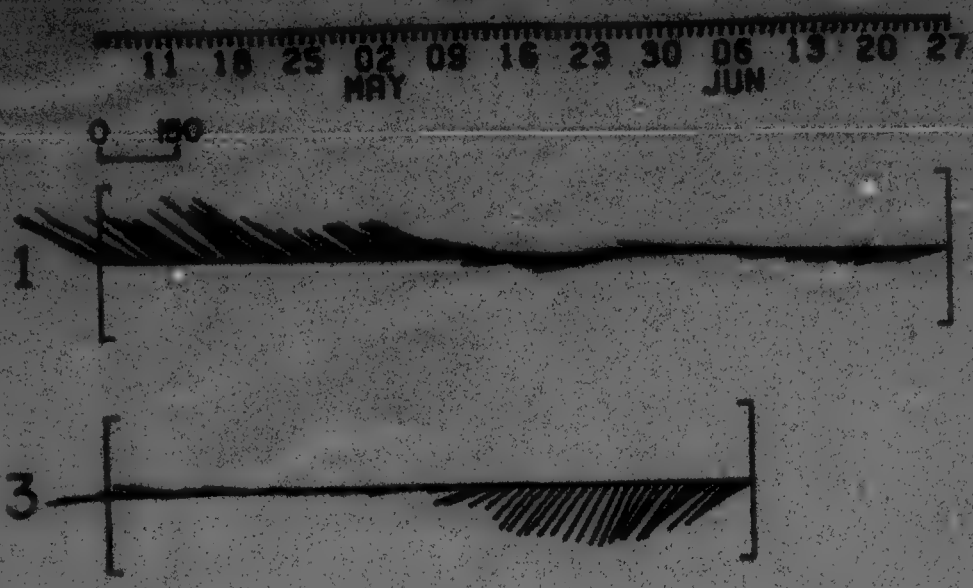

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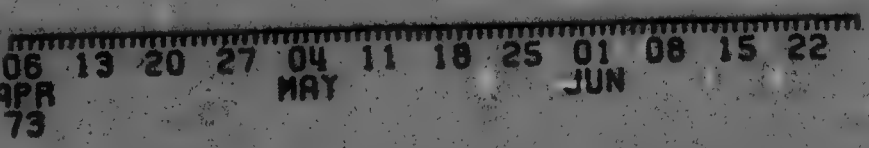

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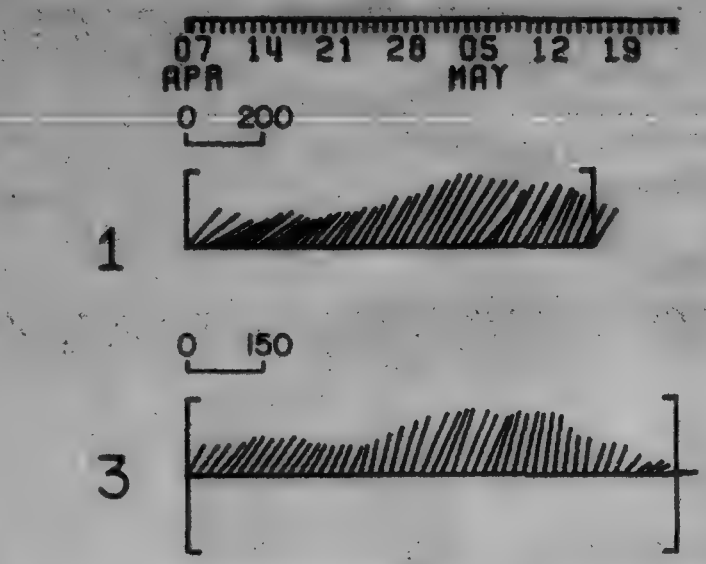

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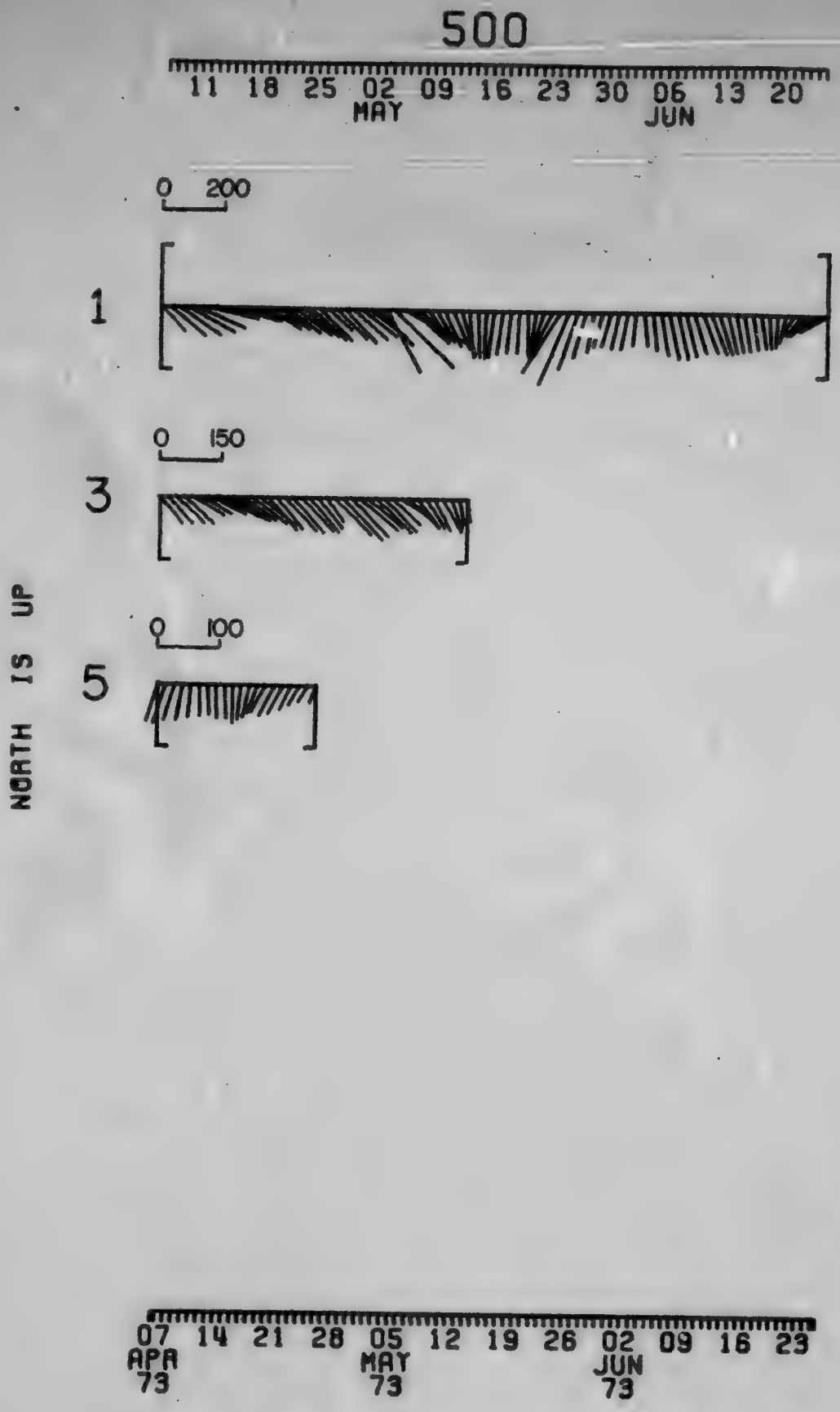
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MAY
JUN
0 200
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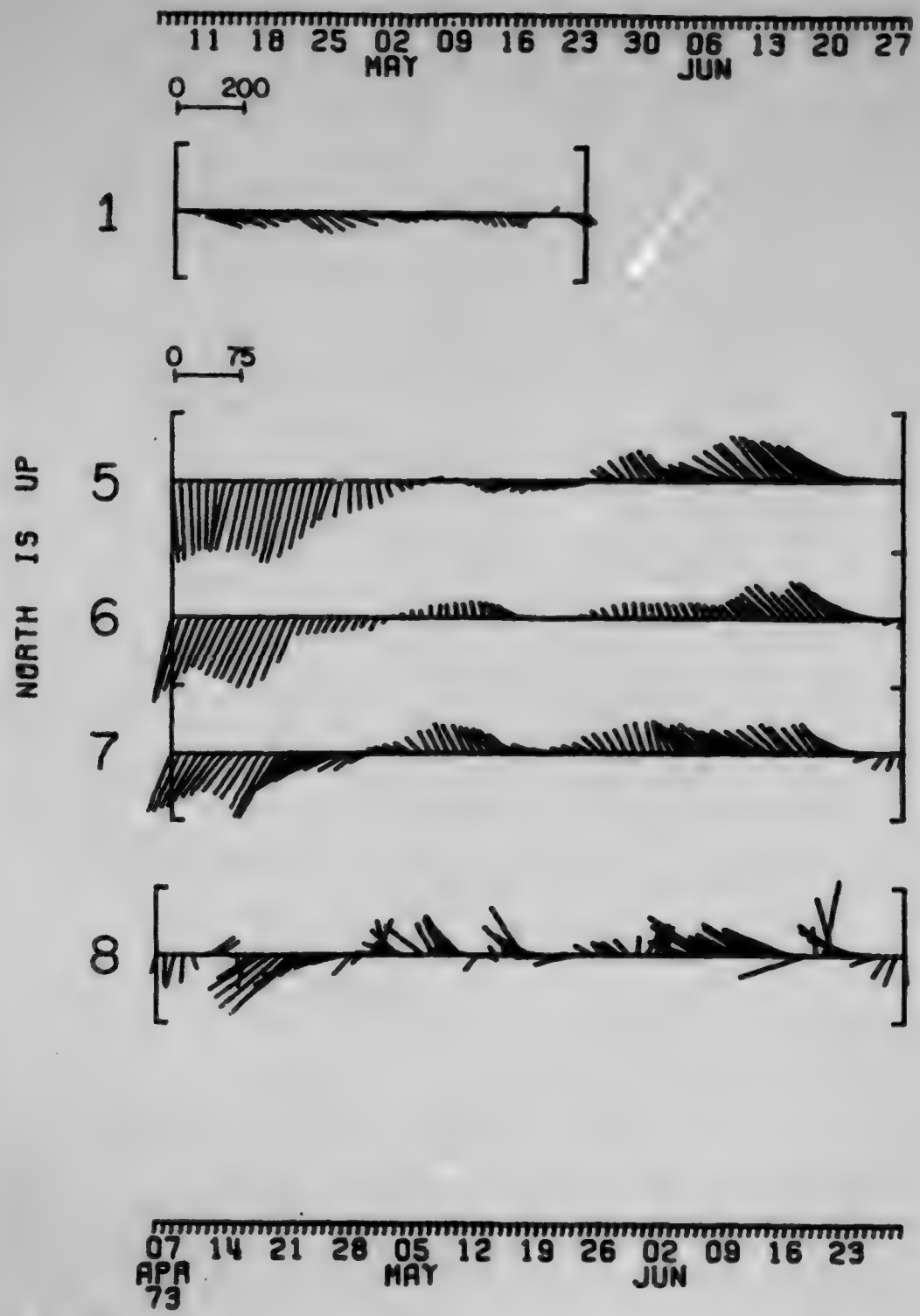
APR
73
MAY
73
JUN
73

501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JUN
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APR
73
MAY
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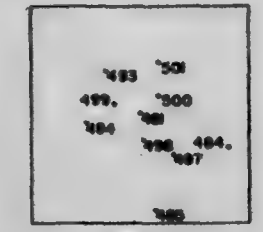
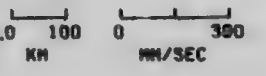
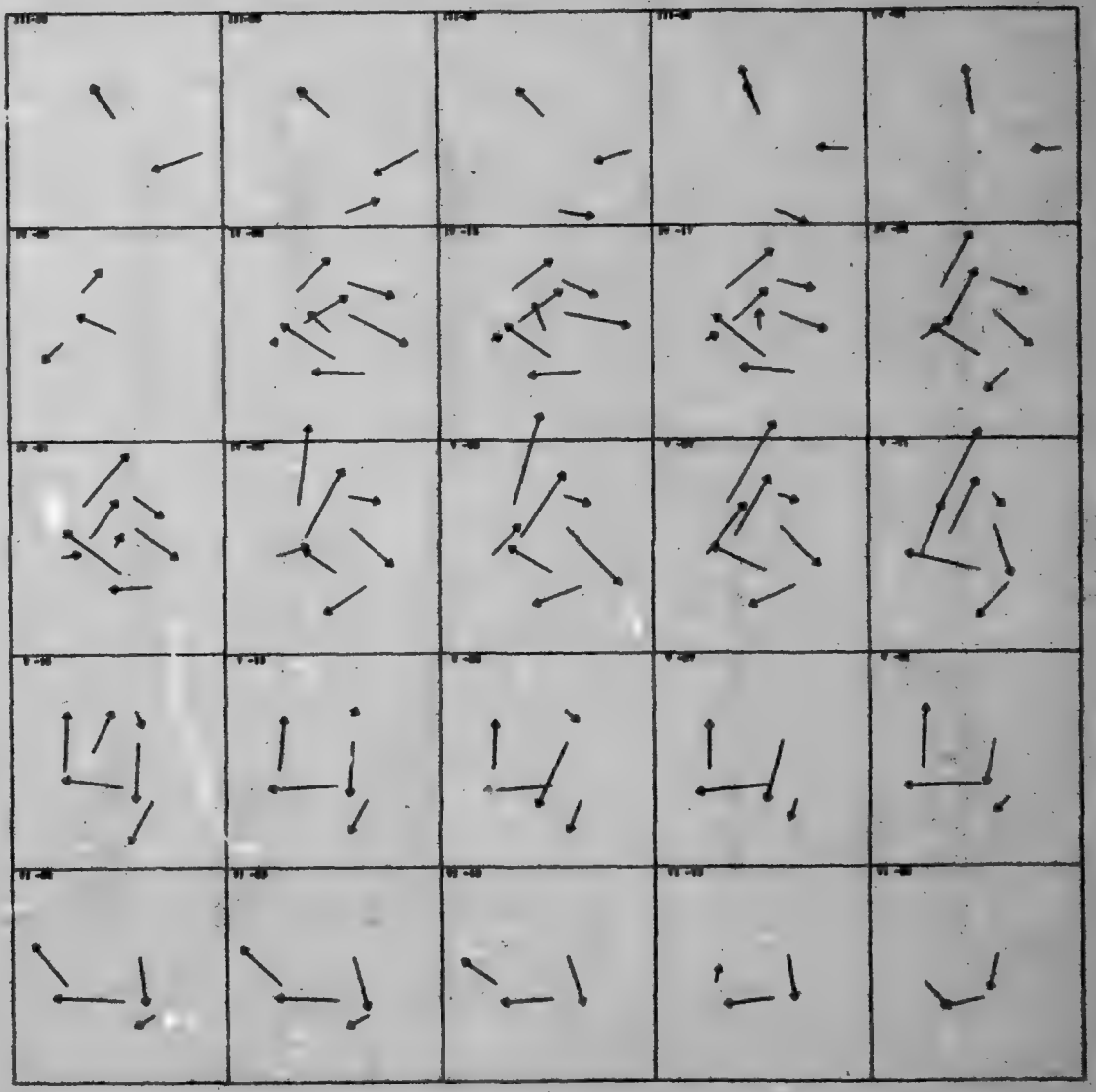


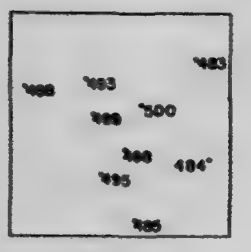


MODE-1 500 METERS

WHOI DATA NUMBER	MODE MOORING NUMBER
4811	1
4812	1
4841	16
4851	11
4931	6
4941	5
4971	9
4981	4
4991	3
5001	2
5011	7

PLOT CENTER POINT
27 58.0 N 69 41.6 W



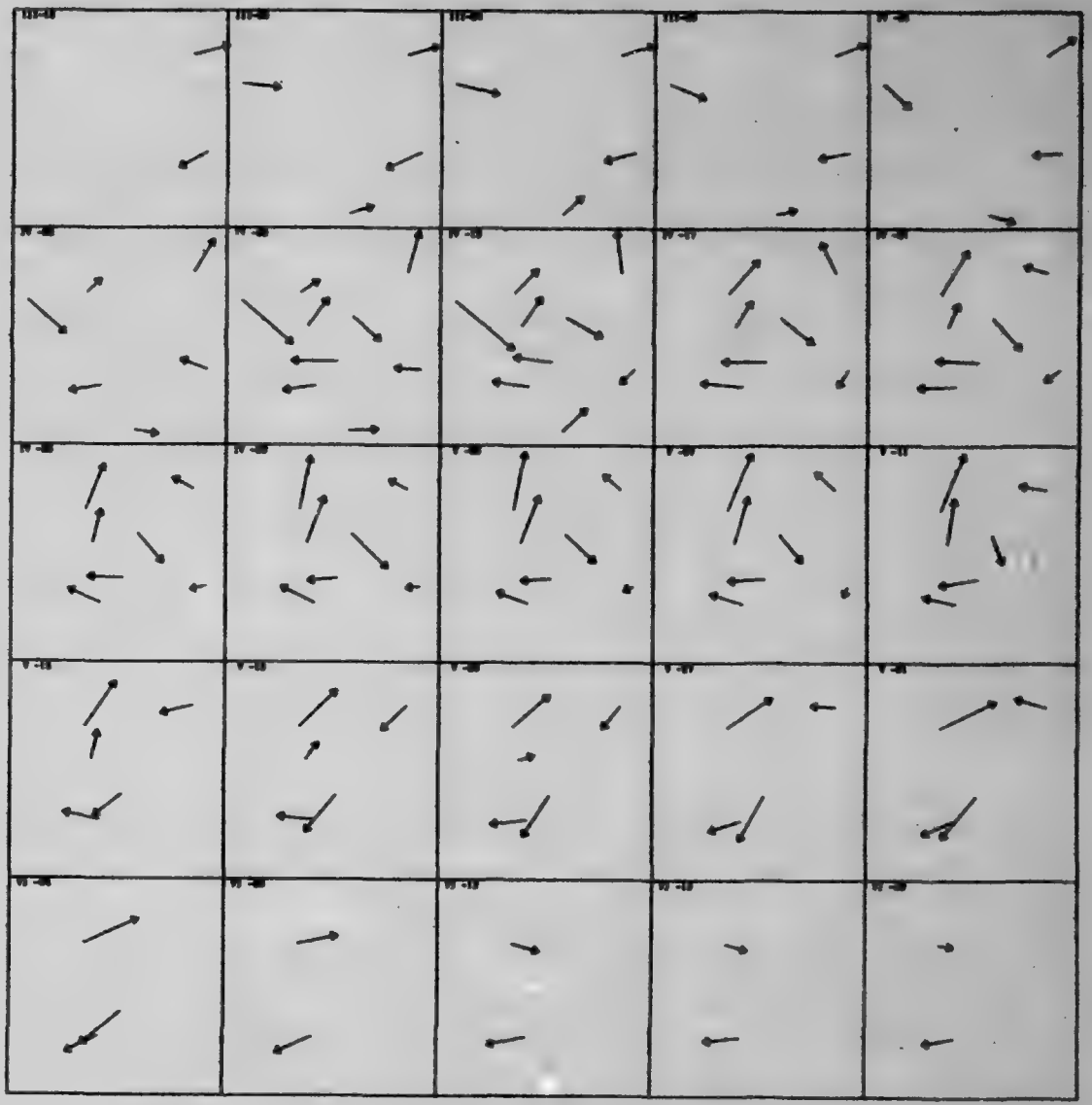


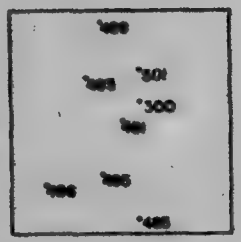
0 100 KM 0 300 MM/SEC

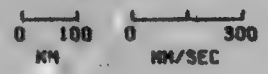
MODE-1 800 METERS

WHOI DATA NUMBER	MODE MOORING NUMBER
4833	15
4843	16
4853	11
4883	13
4933	6
4953	10
4983	4
4993	3
5003	2

PLOT CENTER POINT
27 58.0 N 69 41.6 W







MODE-1 1500 METERS

WHOI DATA NUMBER	MODE MOORING NUMBER
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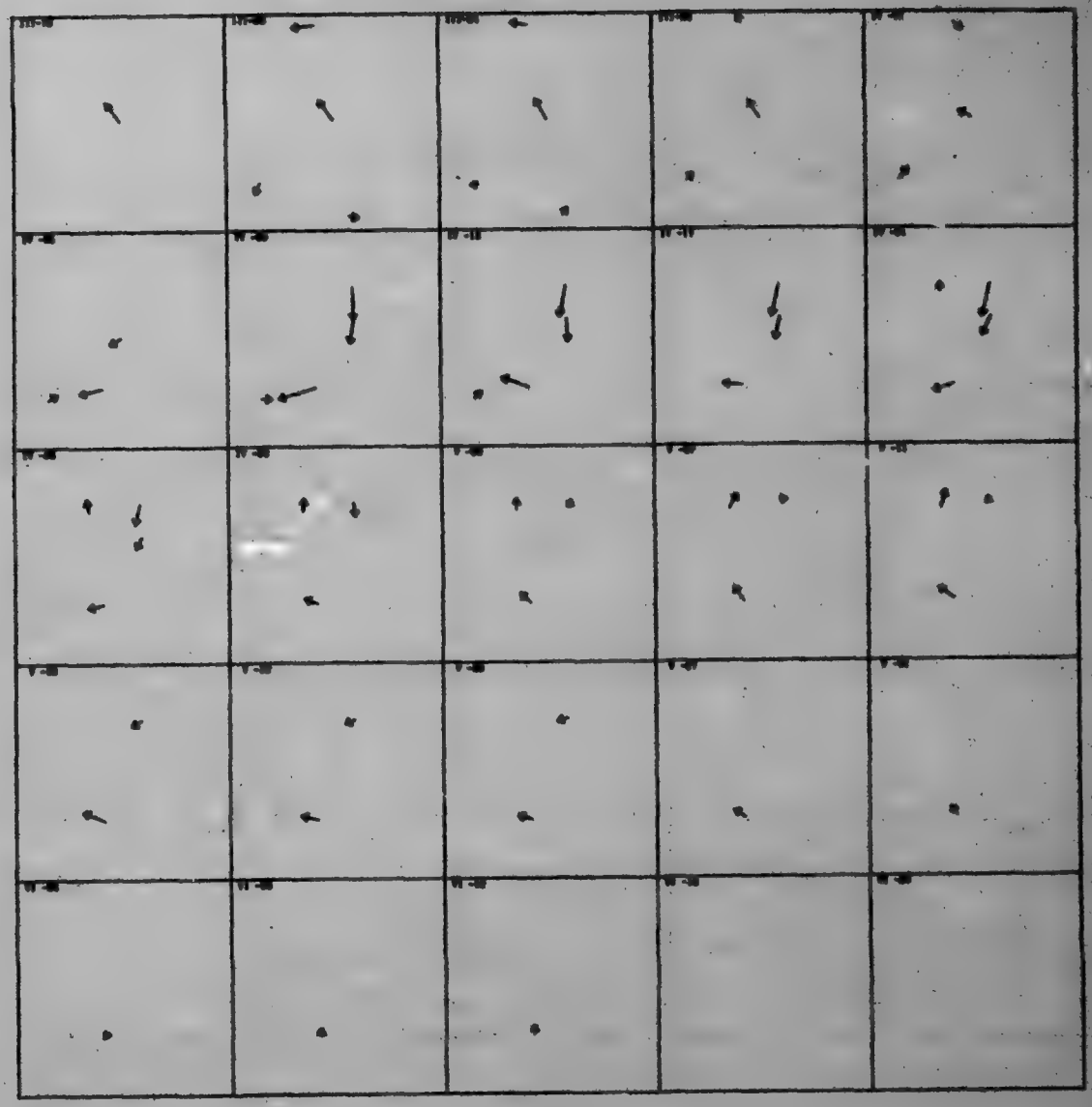
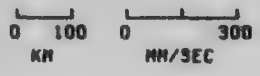
4856	11
4864	12
4894	14
4935	6
4955	10
5005	2
5015	7

PLOT CENTER
27 58.0 N 69 41.6 W





MODE-1 3000 METERS

WHOI DATA NUMBER	MODE MOORING NUMBER
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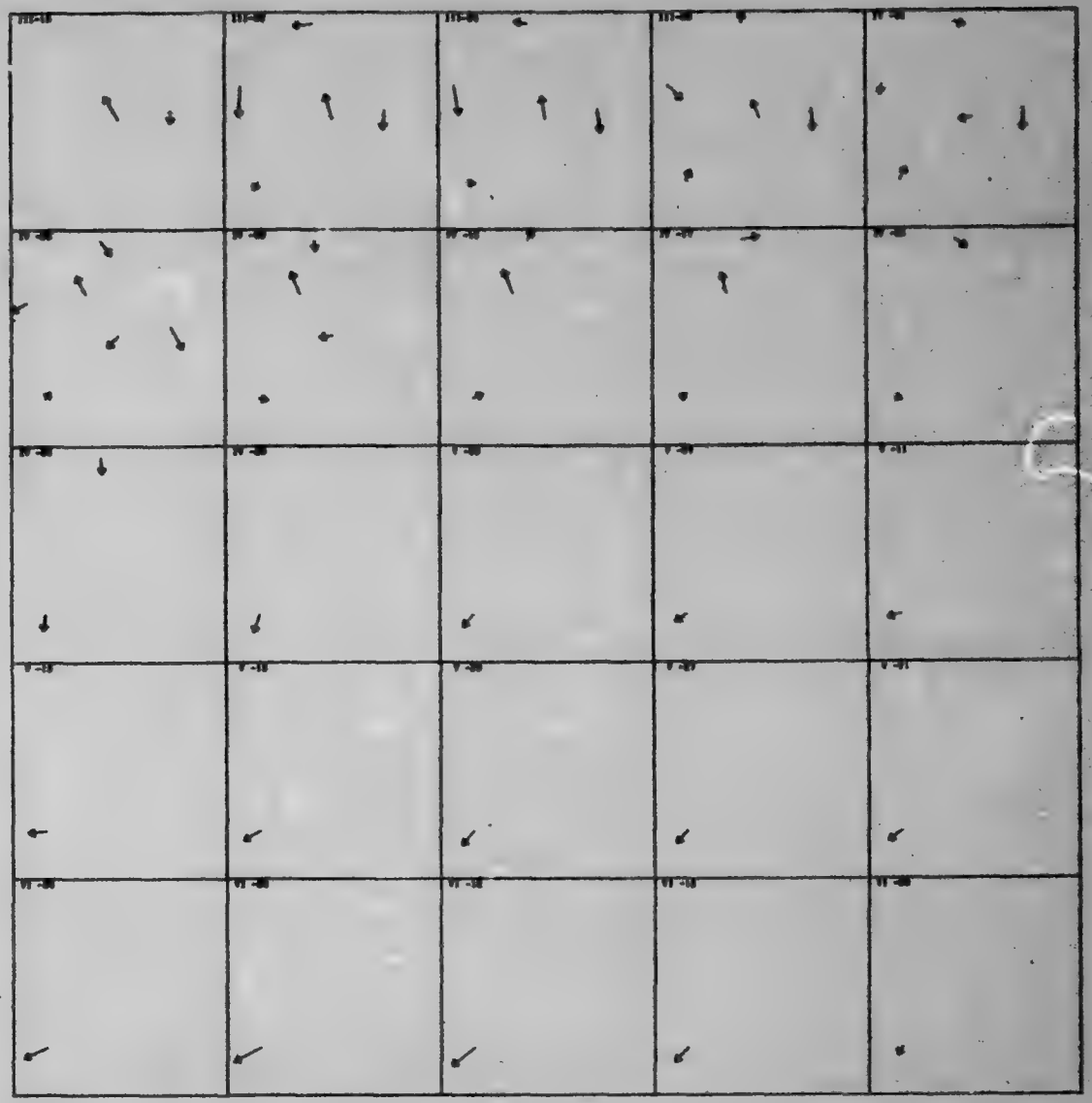
4865	12
4885	13
4895	14
4936	6

PLOT CENTER POINT
27 58.0 N 69 41.6 W



MODE-1 4000 METERS

WHOI DATA NUMBER	MODE MOORING NUMBER
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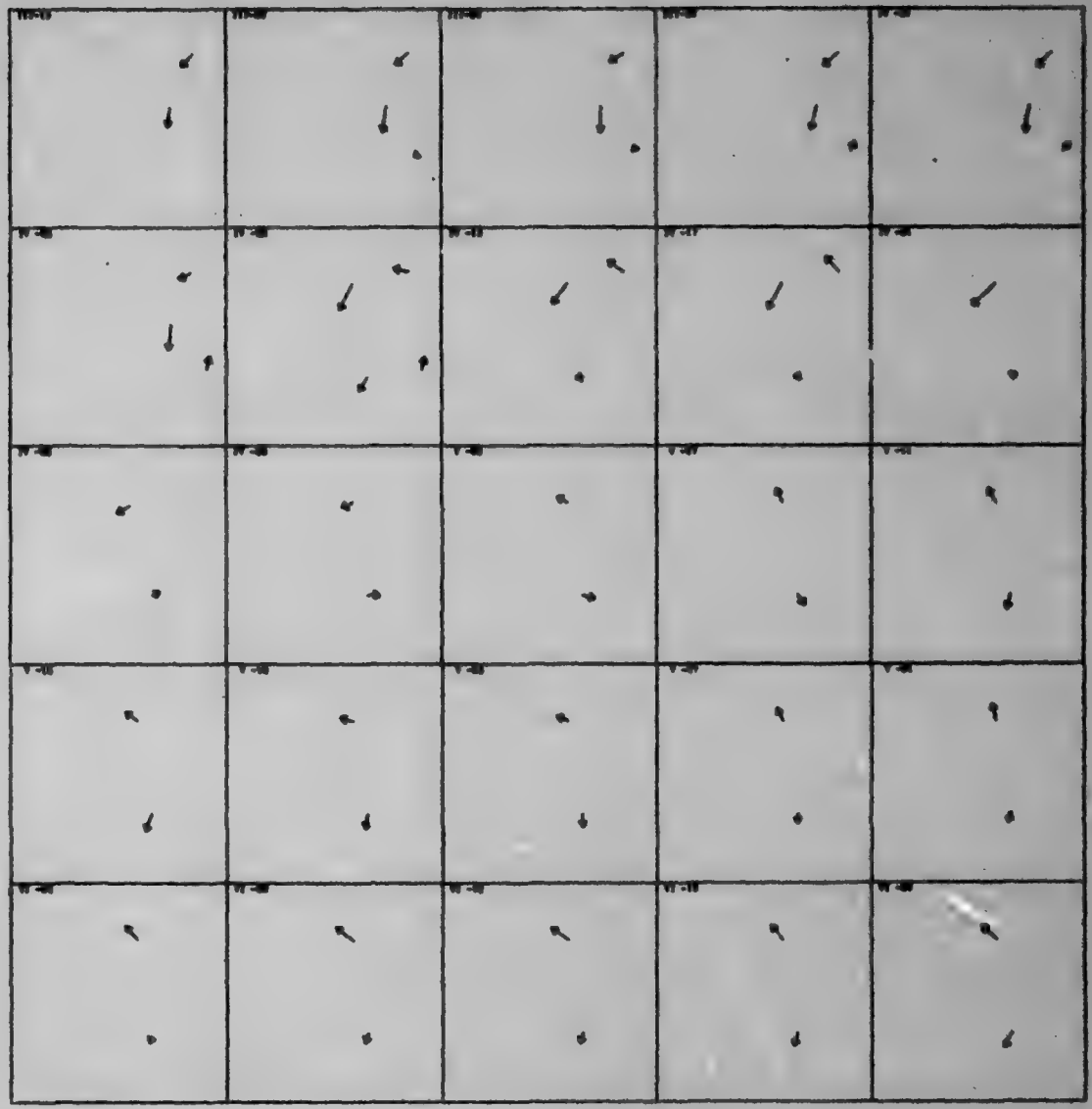
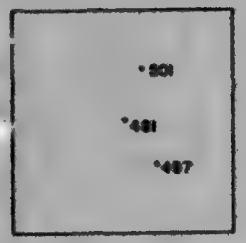
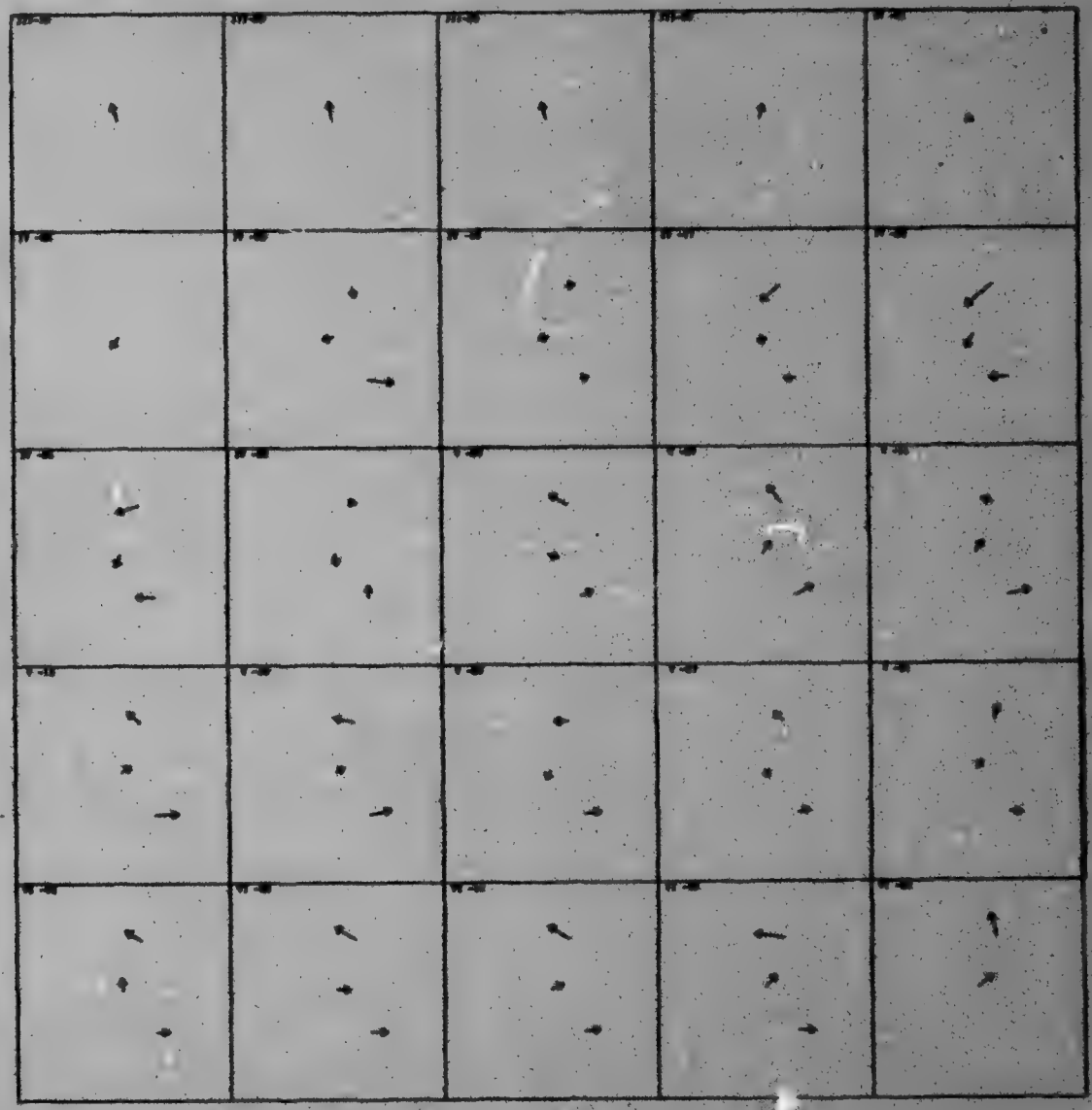
4827	8
4837	15
4847	16
497.11	9
5017	7

PLOT CENTER POINT
27 58.0 N 69 41.6 W







0 180 KM

0 300 MM/SEC

MODE-1 5000 METERS

WHOI DATA NUMBER	MODE MOORING NUMBER
481,18	1
497,13	9
5018	7

PLOT CENTER
27 58.0 N 69 41.6 W

Appendixes

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APPENDIX I

1. Projects, Principal investigators and Institutions

MOORED CURRENT METER ARRAYS		
16 moorings with 4-8 current meters each	N. Fofonoff, W. Schmitz and F. Webster	Woods Hole Oceanographic Institution
5 moorings with 4 current meters each	J. Swallow	National Institute of Oceanography, England
8 moorings with 1 or 2 current meters each	J. Knauss W. Sturges	University of Rhode Island
BOTTOM MOUNTED INSTRUMENTS		
2 IGPP capsules, 1 month lifetime, 1 IGPP capsule, 1 year lifetime (temperature, current, pressure bottom kilometer)	W. Munk, F. Snodgrass and W. Brown	Institute of Geophysics and Planetary Physics, Univ. of Calif., San Diego
6 inverted echo sounders	H. T. Rossby	Yale University
3 electric field recorders, and 3 bottom mounted magnetometers	C. Cox, V. Vacquier, J. Filloux and R. Parker	Scripps Institution of Oceanography, Univ. of Calif., San Diego
5 bottom pressure recorders (fused silica bourdon type)	D. J. Baker, Jr.	Harvard University
FLOAT TRACKING		
20 long-range SOFAR type floats using MILS listening stations	A. Voorhis, D. C. Webb and H. T. Rossby	Woods Hole Oceanographic Institution and Yale University
36 intermediate range acoustic floats tracked by shipborne hydrophones	J. Swallow	National Institute of Oceanography, England
Hydrophone arrays for locating SOFAR floats	R. Walden H. Bertaux	Woods Hole Oceanographic Institution

DENSITY MEASUREMENTS		
Shipboard STD and CTD casts	D. Hansen	Atlantic Oceanographic and Meteorological Laboratory
	J. Crease	National Institute of Oceanography, England
	A. Leetmaa	Atlantic Oceanographic and Meteorological Laboratory
	R. Scarlet	Massachusetts Institute of Technology
MOORED THERMAL ARRAY		
60 temperature-pressure recorders (on W.H.O.I. moorings)	C. Wunsch	Massachusetts Institute of Technology and Draper Laboratory
TOWED INSTRUMENTS		
STD tows to map isopycnal surfaces	E. Katz R. Nowak	Woods Hole Oceanographic Institution
FREE FALL INSTRUMENTS		
Velocity profilers acoustically tracked by using bottom mounted transponders	T. Pochapsky	Columbia University
Electric field free falling probe and bottom recorders	T. Sanford	Woods Hole Oceanographic Institution
Displacement type current probe	W. S. Richardson	Nova University
Airborne expendable (2000)		
NUMERICAL MODELING AND THEORETICAL STUDIES		
Synoptic maps for MODE-I	F. Bretherton	The Johns Hopkins University
Interactions between short internal gravity waves and larger scale motions in the ocean	K. Hasselmann	University of Hamburg
MODE array design as an inverse problem	M. Hendershott, R. Davis and W. Munk	Scripps Institution of Oceanography
Theory and computer experiments on oceanic eddies and waves	P. Rhines	Woods Hole Oceanographic Institution
Analytic and numerical studies of mesoscale motions	A. R. Robinson	Harvard University

A theoretical-numerical study of geostrophic eddy motions in the oceans	P. Welander	University of Gothenburg
ADMINISTRATIVE		
Funds for travel, executive officer, meetings, etc.	H. Stommel and D. Moore (on leave from Nova University)	Massachusetts Institute of Technology

Additional Associated Projects

5 Filloux-type bottom mounted tide gauges and 1 Hewlett Packard pressure gauge	H. Mofjeld	Atlantic Oceanographic and Meteorological Laboratory
Monitoring earth's magnetic field at island stations	J. Larsen	University of Hawaii, Hawaii Institute of Geophysics
Bottom mounted vertical electric field measurements	R. Harvey	University of Hawaii, Hawaii Institute of Geophysics
Bottom mounted magnetometers	R. Von Herzen	Woods Hole Oceanographic Institution

2. Ships

R/V CHAIN	Woods Hole Oceanographic Institution, Woods Hole, Mass.
R/V EASTWARD	Duke University Marine Laboratory, Beaufort, N.C.
R/V TRIDENT	University of Rhode Island, Narragansett, Rhode Island
RRS DISCOVERY	National Institute of Oceanography, Wormley, England
R/V RESEARCHER	Atlantic Oceanographic and Meteorological Laboratory, Miami, Florida
R/V HUNT	MODE charter from TRACOR/Marine Acoustical Services, Ft. Lauderdale, Florida

APPENDIX II

MODE CONTRIBUTIONS

No.

1. Scarlet, R. I., 1973
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   Pressure and Temperature Measurements at the Bottom of the Sargasso Sea, Nature 245 (141), 25-26.

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No.

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MODE: IGPP Measurements of Bottom Pressure and Temperature, Journal of Physical Oceanography, 5 (1), 63-74.

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Observations of Strong Current Shears in the Deep Ocean and Some Implications on Sound Rays, Journal of the Acoustic Society of America, 56 (4), 1118-1121.

18. Zenk, W., and E. J. Katz, 1975
On the Stationarity of Temperature Spectra at High Horizontal Wave Numbers, Journal of Geophysical Research, 80 (27), 3885-3891.

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Vertical Energy Propagation of Inertial Waves: A Vector Spectral Analysis of Velocity Profiles, Journal of Geophysical Research, 80 (15), 1975-1978.

20. Withdrawn.

21. Bruce, J. G., and E. Firing, 1974
Temperature Measurements in the Upper 10 m with Modified Expendable Bathythermograph Probes, Journal of Geophysical Research, 79 (27), 4110-4111.

22. Scarlet, R. I., 1975
STDs in MODE: A Grab Bag of Calibration Problems: The Results, Proceedings of the Third STD Conference (Supplement), Plessey Environmental Systems, San Diego CA.

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Midocean Mesoscale Modelling, Proceedings of Symposium on Numerical Models of Ocean Circulation, ISBN 0-309-02225-8, National Academy of Sciences.

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On the Interaction Between Short Internal Waves and Larger Scale Motions in the Ocean, Hamburger Geophysikalische Einzelschriften 23, 1-107.

26. Olbers, D., 1974
On the Energy Balance of Small-Scale Internal Waves in the Deep-Sea, Hamburger Geophysikalische Einzelschriften 24.

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Measurements of Vertical Fine Structure in the Sargasso Sea, Journal of Geophysical Research (Internal Wave Issue), 80 (3), 314-319.

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Mineral Deposition in Current Meter Bearings, Deep-Sea Research, 22 (10), 703-706.

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MODE CONTRIBUTIONS

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A Technique for Objective Analysis and Design of Oceanographic Experiments Applied to MODE-73, Deep-Sea Research, 23 (7), 559-582.

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On Spatially Growing Baroclinic Waves in the Ocean, Journal of Fluid Mechanics (in press).

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Observed Interaction Between Oceanic Internal Waves and Mesoscale Eddies, Deep-Sea Research, 23 (9), 805-820.

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No.

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Observations on the Vertical Polarization and Energy Flux of Near-Inertial Waves, Journal of Physical Oceanography (submitted).

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No.

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